THE BUILDER

VOL. C.—No. 3545. JANUARY, 13, 1911.

CONTENTS.

	PAGE
Competition Methods	33
The Royal Academy Winter Exhibition	34
Notes (with Illustrations)	35
The Sketch Society	36
The Architectural Association (with Illustrations)	36
Architectural Societies	41
General News	41
Legal Column	42
Law Reports	42
Competition News	42
Correspondence	43
Intercommunication Column	43
Editorial Summary	44
Meetings	44
Fifty Years Ago	44
Notes to Illustrations	44
Obituary	44
Monthly Review of Construction :—	
Notes on Some Definitions used in Structural Mechanics.—I. (with Illustrations)	45
Reinforced Concrete Stanchion Base (with Illustrations)	47
Exhibition Buildings.—IV. (with Illustration)	48
The Balg Hollow Bricks (with Illustrations)	49
Notes (with Illustrations)	49
The Building Trade :—	
Helpmeets	50
The London Building Act	51
Specialists	51
The late Mr. J. Howard Colls	51
Sir John Aird (with Portrait)	51
Arbitration in Contracts	52
Prevention of Corruption Act	52
Saving Cement from Empty Bags	52
The Wood Trade	53
General Building News	53
Projected New Buildings in the Provinces	54
The Surveyors' Institution	55
The Nottingham Architectural Society	56
Foreign and Colonial	57
London Councils	57
Books	57
List of Competitions, Contracts, etc., Open	58
Patents	60
Some Recent Sales	60
Prices Current	61
Tenders	61

Illustrations.

Design for King Edward VII. Memorial, Bristol: View. Messrs. Lanchester & Rickards, FF.R.I.B.A., Architects.

Design for King Edward VII. Memorial, Bristol: Plans. Messrs. Lanchester & Rickards, FF.R.I.B.A., Architects.

"Bathers," R.A. School Designs for Decoration of a Public Building. By Miss Katharine F. A. Clausen, Miss Edith M. Hosking, Mr. Hugh de Poix.

R.A. Schools: Prize Design, "The Entombment."
By Mr. P. Bryant Baker. (See "Note" on page 35.)

COMPETITION METHODS.

WERE it not for the fact that the preparation of an architectural design is in itself a most fascinating and exciting pursuit we should see a very different response to those who set these problems to members of the architectural profession. No one can for a moment imagine that the expectation of an adequate pecuniary reward is the main inducement when it has again and again been so clearly shown that this reward is in any case but little more than the competitors collectively have expended on the preparation of their designs. It may be suggested that the innate vanity of the artist buoys up each competitor with the belief that his chance of success is a good one, but after a few experiences we may be fairly certain that he will recognise that there are many circumstances tending to bring about a distribution of fortune's favours over a much wider area than he at first thought possible.

The reasons for this are not far to seek. Every architectural problem has a number of solutions, involving an almost infinite variety of considerations, some economic, some æsthetic, and some composite; and no two men will attach the same relative value to these. To give a few examples of what we mean. One architect in his design will consider it of the first importance that the treatment should be that best expressing the intention of the building, while another would regard it as demanding modification to a greater or less extent to secure harmony with the surroundings; in another case the degree of embellishment justified by the type of building would be variously estimated; while in purely economic matters there is also room for considerable divergence in opinion. The economics of construction may conflict with the

economics of subsequent control; and, again, economy of plan may have to be balanced against architectural effect. In all such cases, as we have said, no two architects will take exactly the same view, and consequently, especially with the single assessor, there must be a large element of uncertainty in competition results.

In addition to this the competitor himself is not always at the same level of ability, sometimes rising above his average capacity and sometimes falling below it. These do not exhaust the reasons why no one can expect, in this individualistic country, to stand more than a strictly limited chance of winning a competition.

This being the case, it is clear that our architects would not support the competition system as a means of livelihood were it not for the attractions of the work itself, which may be described as one of the finest games of skill, no less fascinating than those others, from chess to the jig-saw puzzle, to which the human mind addresses itself without hope of pecuniary reward.

At the same time, when an architect sits down to work out a competition design he finds himself at the commencement facing a mass of preliminary drudgery, and it is with a view to giving a few hints as to the possibility of minimising this that these lines are penned.

These preliminaries usually involve more work in the case of buildings containing a number of rooms of varied sizes, such as we find in a block of municipal offices, a courthouse, or a library. In these cases the competitor will see before him three main factors of his problem—the site, the cost, and the schedule of accommodation.

This last will give the net areas of the rooms, and these the competitor will add up in groups or departments, carrying them to a grand total. He can form a rough estimate of the net area he will be able to get on the site by means of a very rudimentary sketch plan, and by dividing the grand total by this he will obtain the number of floors; at the same time he must see that the departments can be placed on suitable floors, and not too much subdivided. In the case of large rooms not on the top floor he may consider that they should take up two stories, in which case their floor area should be counted as double.

As regards cost, it may save much time to take the net cubic contents of the rooms given in the schedule, *i.e.*, the areas multiplied by suitable heights, and use this as a basis for the estimated cubic content of the building. By carefully comparing examples of buildings similar in type to that proposed we can obtain approximate data on which to do this. For example, we find perhaps that corridors, staircases, etc., have an area of some 50 per cent. and walls some 15 per cent. of that of the rooms.

Assuming that horizontally 60 per cent. is accommodation and 40 per cent. accessory, we can then proceed to deal with the vertical proportion, and may find that 25 per cent. is taken up by foundation, floors, roofs, etc. Thus we may come to the conclusion that the net cubic content of rooms according to the schedule is 45 per cent. of the gross cubic content of the structure. Of course, it may be more or may be less according to the character of the building and the suitability or otherwise of the site, but if the competitor has prepared himself by the study of his subject he will be able in the course of a few hours to decide whether the proposals are fair and reasonable or not.

It is a waste of time to attempt to plan in detail before making a careful analysis of the requirements. Thus, it may be wise to prepare diagrams of various departments or sections of a building in order to get the rooms in their proper relation to each other; if this is all attempted on the sketch plan the problem will appear much more difficult. By diagrammatic analysis of this kind it can be decided in what manner it is possible to bring the various rooms or departments into the desired relationship with each other.

Tested by this method it may sometimes be found that the intercommunications stipulated for in the conditions are not possible, and much time will be saved if the competitor checks their practicability before wasting hours in trying to achieve the impossible. But in this procedure he must be careful to remember that a building has three dimensions, and that a difficulty that appears insoluble in a horizontal plane may be overcome by the introduction of the vertical factor. The economic side of planning is a science, but not a difficult one if the designer is well informed on his subject. The æsthetic side is, however, quite another matter, and demands imaginative qualities in its exponent. Even here experience and study will be of the greatest assistance in enabling the designer's aim to be quickly and effectively realised with a view to either adoption or rejection. Architects work in so many different ways that it would be futile to attempt to formulate rigid rules. We may merely suggest that the preliminary stages of a competition design should comprise the preparation of a number of sketches based on various main ideas as to the handling of the scheme, followed by an analytical comparison of the advantages and disadvantages of each.

We have often heard it laid down as an axiom that a plan should "read easily," and in the main this may be taken as correct, the probability being that if the lines appear simple and clear the building will be a convenient one. We must, however, reach a stage beyond this, as it by no means follows that because a plan is easy to read it is consequently the best and most artistic solution of the problem. In a building of complex requirements there are variations of scale and proportion which it is necessary to resolve into each other, besides differences in the degree of architectural importance dictated by the different purposes of the various parts; a plan may achieve simplicity by ignoring these, and in this case will not indicate any merit in the design. Put briefly, the plan must be as simple and clear as possible, provided all the essential requirements, artistic and practical, have been met.

Much more might be said in regard to various considerations that enter into design—such as the use and abuse of centre lines; the demand for symmetry, absolute or modified; the technique of expression; but these are equally applicable to design in general and do not fall within the scope of our remarks on competition methods.

THE ROYAL ACADEMY WINTER EXHIBITION.

THE Winter Exhibition at Burlington House consists of works by five deceased British artists. There is an adequately representative show of the works of Sir W. Q. Orchardson; a fairly good collection of J. M. Swan's pictures, although we would gladly have seen a larger number; a few good Friths and David Farquharsons, as well as some of the more important pictures of R. W. Macbeth.

The Swans and the Friths are particularly welcome. The summer exhibitions have made Orchardson's manner and treatment so familiar that the present exhibition does not seem to have anything fresh to tell us. We do not know indeed that Orchardson's art gains by being seen, as it were, in the bulk. His consistency to his well-known colour scheme fatigues the eye a little; it suggests a certain monotony of outlook in which there would seem to be some absence of imagination. One or two of his earlier pictures—take, for instance, "On the Lagune," painted in 1875, leave one with some regret that he subsequently adhered so persistently to the colour schemes of yellows and golden browns; that he departed from the direct study of nature, as in the picture we have mentioned, for the anecdotal costume type of subject. No amount of technical skill can atone for this somewhat wilful limitation of imaginative outlook. In portraiture Orchardson nearly always excelled. Dignified, sedately interpretative, with now and again a flash of inspiration, his portraits will rank among the most important art of the kind of the last fifty years. A large number of his most notable pictures have been gathered together for the present exhibition.

The work of J. M. Swan suggests a very different order of mind, and the present collection of his work can only add to his reputation. The variety of his artistic range will come as a surprise to many. Swan, apparently, never fell under the spell of a purely personal convention. Largely known for his paintings of animals, to the study of which he brought a new seeing, he is represented by other phases of artistic expression scarcely less distinguished for boldness and individuality, for imaginative distinction, for pleasant colour. Plainly, Swan could not limit himself to a formula which did not seek continual inspiration from nature, or comprise incessant fresh observation, whether it were in the study of a Polar bear on an ice hummock or a boy bathing from the bank of a stream. And he invested almost everything that he painted with a fine imaginative quality, at times playful and quaint, at times powerful and spacious; the pretty fantasy of an idyll or the spacious poetry of the jungle or Polar solitudes. The

large number of sketches in the Water-Colour Room go to show how tireless his pencil was in seeking direct study. He seems to be less successful in his purely subject pictures, such as "Dante and the Leopard," or "Orpheus Charming the Lions," where his imagination sought expression through the medium of Dante's verse or Greek mythology. Plainly, Swan did not need to seek inspiration outside his own sufficiently poetic apprehension of things. The vitality of his art extends to his portraits, of which there are four in the gallery devoted to his work; these are quite as personal and distinguished as his other pictures, and as remote from the average Academy portrait as they can well be.

To the present generation Frith's pictures come with some novelty, notwithstanding the typical critical attitude of contempt for most early or mid-Victorian things in art. They also come with some freshness, and create misgivings as to the value of points of view which have sought to depreciate his work. Frith was no pot-boiler. In the grouping and characterisation of his costume pictures may be found the tireless and patient ingenuity of a man in love with his work, at any rate; there are also colour and design, even with the smooth technique so opposed to any impressionistic manner of painting. But more than that, the man who tiring of the costume and model type of picture, turned to the contemporary life of Paddington Station and Ramsgate Sands and invested these scenes with so much animation and dramatic power, must have possessed a striking and original talent. These pictures found an immediate success when they were painted, and the lapse of half a century or so revives an interest in dress and manners no longer ours, which in its way is a testimony to their artistic vitality. And it were absurd not to concede to Frith a surprising aptitude for spacious composition, notwithstanding the infinite variety of episode and detail which go to make up his completed works. We would note in his case, as with some of the other painters at the present exhibition, that he gains immensely in freshness and effectiveness when he leaves the predetermined, historico-anecdotal subject of models and costumes to portray life with which necessarily he is in closer touch: the life of Ramsgate sands in the summer, or the microcosm which his inventive mind and eye discovered in the spectacle presented at Paddington Station before the departure of a train.

Of quite another school are the spacious landscapes of David Farquharson, surely one of the finest exponents of landscape of the modern British school, when he is at his best. His work strikes us as being a little uneven; but in the "Full Moon and Spring Tide" and "Winter," he reaches a high standard. These large canvases of spacious moonlit sea or snow-capped mountain are wonderfully vigorous transcripts of nature in a romantic mood. There are also numerous paintings and etchings by Robert W. Macbeth, as well as the Swan sketches and bronzes. Many of the bronzes have been seen at the summer exhibitions in recent years.

NOTES.

Royal Academy Schools.

In addition to reproductions of designs for the decoration of a public building (see inset plates) we give in this number some illustrations of sculpture produced by Royal Academy students. Mr. P. Bryant Baker, besides winning a Silver Medal for his "Portrait Bust from the Life," secured a first prize for his model, "The Entombment" (p. 33). The conditions of this competition are similar to those for the Armitage prize in painting—*i.e.*, students have to make a preliminary design of the subject. At ten o'clock on an appointed day a subject is set, and students must on no account leave the galleries until their sketch is complete and handed to the registrar. The designs are held until the larger ones are complete, a matter of four days. No life models are allowed, and it is purely an original design from memory. Probably this is the best test of inventive ability in all the Academy competitions, and Mr. Bryant Baker has achieved a notable success. His is a four-figure composition, which is unusually ambitious, and in observing the true canons of the sculptor's art he has brought vitality to the subject. The tone of reverence is markedly present, and altogether it is a sincere interpretation of a scene which lends itself to pathetic suggestion. Mr. Ware's "Wall Fountain" (this page) is of more utilitarian significance, yet the artist has found opportunities for the exercise of his imagination. The model, which is 3½ ft. high, is the preliminary step towards the finished work in marble, and according to the conditions imposed it is somewhat ornamental. Mr. Ware has given architectural feeling to his design, and has managed his details with considerable cleverness.

Limited Competitions.

A Manchester architect claims that the competition for the Library and Art Gallery should have been limited to architects practising in the Manchester district. We confess that we cannot agree with him, as in a building of this importance it is most desirable that the best talent available should be at the disposal of promoters, and architectural advantages far outweigh any small economies that might be effected by the knowledge of local conditions and a saving in architects' travelling expenses. Competitions limited to localities are only admissible in buildings of minor importance, and we feel sure that the architectural profession, as a whole, is entirely

R.A. Schools: Prize Design, Model of a Wall Fountain for execution in marble.
By Mr. Edmund T. W. Ware.

out of sympathy with what may be termed the "ratepayer" argument. This form of limited competition must not be confused with the more legitimate one where architects are selected for their experience in the class of work proposed; with regard to this, no objection can be raised, provided the selection is made with the concurrence of a qualified professional adviser, so as to eliminate the exercise of methods inimical to the cause of architecture and the dignity of its exponents.

Practical Structural Mechanics.

DURING the past few years ferro-concrete, steel frame building, and other more or less novel methods of construction have made great strides, and constantly challenge the skill and constructive ability of architects and builders; but it is an unfortunate fact that the vitally important subject of structural mechanics, associated as it too often is with half-understood formulæ, which produce doubtful results after much tedious mathematical labour, should still remain to a large extent highly uncongenial to students, and even more so to men in practice. For the past three years Professor Lethaby has been making a strenuous effort at the Architectural School of the London County Council Central School of Arts and Crafts, Southampton-row, to render this subject more attractive to building and architectural students by the substitution of practical experimental work and tests for the mathematical deductions of the average text-book. The formulæ and rules in ordinary use are first explained in class by an experienced engineer in simple terms and built up from first principles, and then applied to practical problems of design. The students are then encouraged to prove all their results and deductions by means of models and apparatus upon which the actual stresses and strains induced by different loadings can be clearly seen and accurately measured. The course is as comprehensive as can be desired, including the calculations and design of beams, floors, roofs, columns, arches, walls, shoring, and all problems likely to arise in actual practice; but no mathematics higher than simple equations are employed, and arithmetical work is reduced to a minimum by the employment of graphic statics and the slide rule. That the system is a success has been shown by the fact that students sitting for the Royal Institute of British Architects' examinations have been congratulated by the examiners upon their clear grasp of the subject and by significant evidences of interest in the students themselves—busy men sometimes making every possible attendance over a session of no less than nine months. A separate advanced class is now being formed, in which the work consists entirely of the working out in class of examples of advanced structural design, including large wood and steel roofs, domes, ferro-concrete beams and columns, etc.; and opportunity is given to the students to use the experimental apparatus for the proof of any doubtful point. An article in our current issue by the lecturer is an example of the simple explanations adopted those particular *bêtes noires* of the architect, moment of inertia and radius of gyration, being defined in terms which any intelligent schoolboy could grasp. We wish Professor Lethaby every success in the work, and strongly recommend to our London readers the support of the course.

Paris Fire Brigade.

IN spite of improvements in the appliances at command of the London Fire Brigade lessons may still be learned from abroad and put into practice at home by those responsible for the equipment of the service in question. Going no farther afield than Paris, for instance, we find evidences of progress fully deserving attention. Long known as one of the most efficient fire brigades in the world, the Paris *service d'incendie* is now being re-equipped with petrol-driven fire engines, fire escapes, and salvage vans, and all horse-drawn vehicles are being pensioned off. The engines, escapes, and vans are mounted on *chassis*, propelled by 50-horse-power petrol motors, which in the case of fire engines are arranged so as to actuate either the wheels or the pumps, the latter being of the compound centrifugal type, each capable of delivering 230 gallons of water a minute at the pressure of about 150 lb. per square inch. There is much to be said for re-equipment in accordance with a comprehensive scheme, instead of adding new apparatus piecemeal, as generally happens in this country.

THE SKETCH SOCIETY.

THE Sketch Society has provided a very pleasant exhibition of oil paintings and water-colour drawings at the Royal Institute galleries. The works of each exhibitor are hung together, so that we have a number of small, independent groups of works; and there is much to be said for this sort of arrangement. It is simple, it is not ineffective, and it enables you to form, without dodging about from one part of the galleries to another, some coherent estimate of the versatility or lack of versatility, or perhaps the general aim, of any given painter's work. Decoratively, this kind of arrangement would seem to compare favourably with exhibitions where the work of individual painters is scattered. If you take a large exhibition, like that of the Academy, the attempt to arrange the pictures with any decorative principle in view would seem to become more hopeless every year. The mass of pictures to be dealt with would, in any case, make the task a difficult one. By grouping together the works of individual painters a certain unity of idea is preserved; and this, after all, makes for unity of impression—an essential factor in any decorative scheme.

The pictures of the Sketch Society, as suggested by its title, do not aim at any ultimate accomplishment. But there is much to be said for the *raison d'être* of such a Society, and we might even wish for work of a less elaborate finish than in many cases appear on the walls. A sketch is a first impression: the immediate translation of the artist's idea into the vocabulary of his art, with the blotting out, hesitancy, and quick revision of line and colour which usually go with thought in the making. However imperfect the result may be, it more often than not contains some pleasant, spontaneous touches which are often lost when a more deliberate achievement is attempted. The artistic and marketable value of a sketch is, we fancy, at times under-rated. The present view of painting insists upon patient elaboration and revision. But, as we know, in the arts of verse and prose elaboration and revision have been more or less impossible to a certain order of mind. A good deal depends upon the temperament of the artist. Byron, for instance, declared that he could only arrive at poetic expression at one spring, or not at all. That is to say, that he never really advanced beyond the "sketch" stage. But there is something to be said for this spirit of fine impatience, and Byron, after all, counts. Why should not the same sort of temperament count in the graphic arts? But perhaps it does. There is Mr. Brangwyn, who is certainly of the Byronic order.

But Mr. Brangwyn is not represented at the present exhibition. There is, however, the quieter method of Mr. Monk, who is here certainly represented at his best. We have not always been in sympathy with this artist, but here he is lively and imaginative, sketchy and extremely effective. Mr. Charles Dixon, also, in his various scenes of shipping of yesterday and to-day, provides a group of quite effective sketches. The work of Mr. Alfred Gilbert is on a broader plane, but it has the quality of immediate impression. And there are the pictures of Mr. Terrick Williams, Mr. David Green, Mr. Basil Woodhouse, Mr. J. Herbert Snell, and many others which call for mention in this respect.

Without, however, attempting to distinguish the qualities of the various artists (there are some 600 pictures) who are mostly content with a formula of British art with which we are all familiar, let us say that the general level of the exhibition is by no means inconsiderable. There are, indeed, many pictures which suggest poetic and imaginative gifts. There are others which show a distinct appreciation for painting in its decorative aspects, and here and there, although rarely, we find a drawing indicating that the artist has some understanding of the pictorial treatment of architecture. 'Tis a modest exhibition, but quite a pleasant one.

ARCHITECTURE AS PLAN AND SECTION.

AN ordinary general meeting of the Architectural Association was held on Monday, at No. 18, Tufton-street, Westminster, S.W., the President, Mr. Arthur Keen, in the chair.

The minutes and nominations having been read and confirmed,

Mr. Raymond Unwin and Mr. A. O. Hector were elected as members.

The President, having announced the reinstatement of Mr. A. S. Dorrell, proposed a vote of thanks to Mr. J. Macvicar Anderson for a donation to the Library of two volumes of the *Builder* for 1910. This was agreed to.

He also made the following announcements:

The first Spring Visit on Saturday, January 21, to the Law Courts extension, by permission of Sir Henry Tanner. Members to meet at the building at 2 p.m.

An all-day school visit on Friday, January 13, to Colchester.

Mr. H. H. Statham then read the following paper on

ARCHITECTURE AS PLAN AND SECTION.

"Many years ago there appeared in the *Westminster Review*, in the days when that periodical was an intellectual power in the land, a remarkable article on "Winckelmann and Greek Art," which to some extent coloured my feelings about art for the rest of my life. The author, as I learned long afterwards, was Walter Pater, and the article was probably his earliest essay on æsthetic subjects. In the course of it, speaking of the distinction between architecture and the arts of sculpture and painting, he said:—

"The arts may thus be ranged in a series, which corresponds to a series of developments in the human mind itself. Architecture, which begins in a practical need, can only express by vague hint or symbol the spirit or mind of the artist. He closes his sadness over him, or wanders in the perplexed intricacies of things, or projects his purpose from him clean-cut and sincere, or bares himself to the sunlight. But these spiritualities, felt rather than seen, can but lurk about architectural form as volatile effects, to be gathered from it by reflection; their expression is not really sensuous at all. . . . Architecture is the mode in which the artistic effort centres."

Here was a totally abstract conception of architecture, as the walling up and covering in of a space, and as capable of poetic expression from that point of view alone, independent of any considerations of style or detail. That sentence, "He closes his sadness over him, or wanders in the perplexed intricacies of things," has haunted me ever since. If you come down to the primary elements of architecture, does it not consist in laying out a plan in an effective manner, and in covering in that plan in a manner at once effective and structurally sound? I am asking you to consider architecture this evening from that point of view. There is a moral connected with it; but the moral, according to traditional usage, comes at the end.

Roofs and Plans.

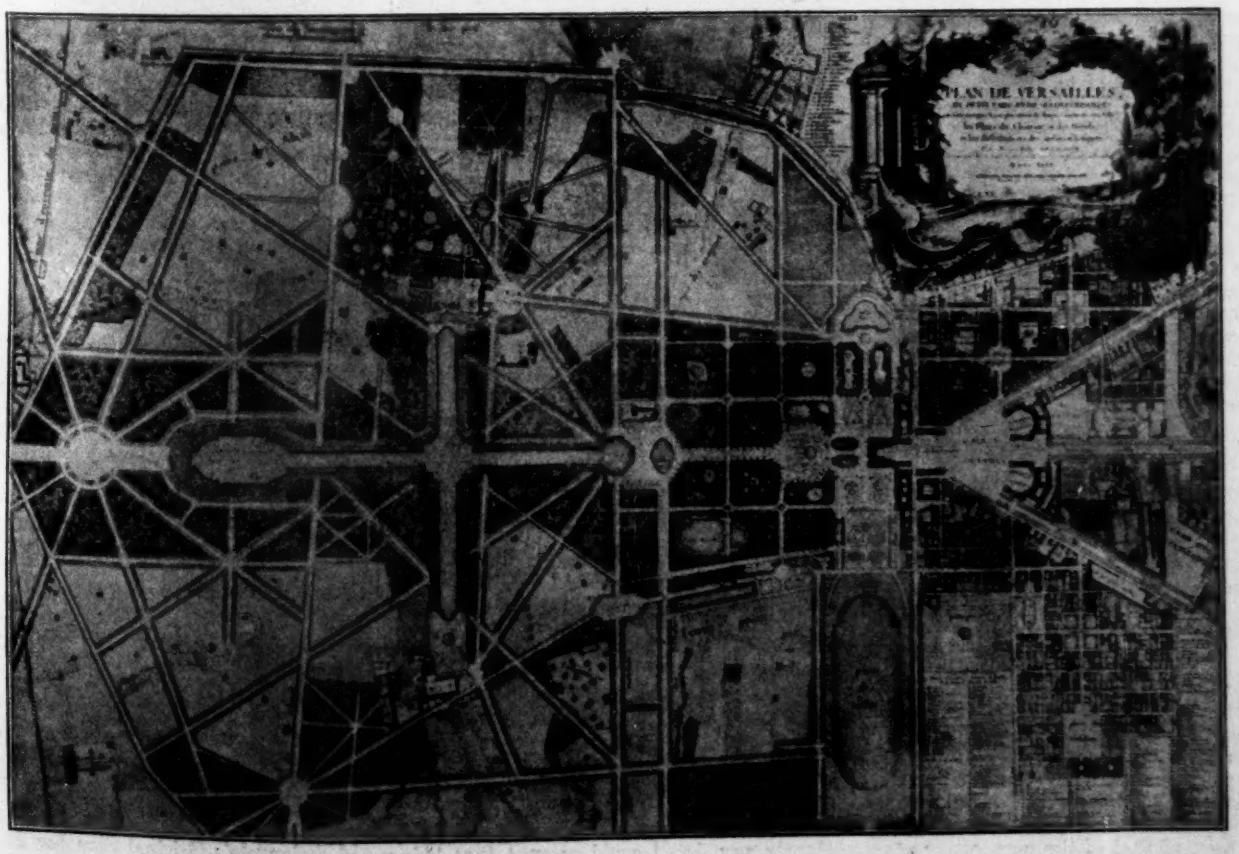
No architect worth the name ever lays out a plan without having present in his mind at the same time the manner in which he means to roof it in; and the mere aspect of a plan on paper at once sets the mind thinking as to what the section of the building would be. But even apart from that consideration, a plan, merely as plan, has its own expression and its own suggestiveness. Does not the typical Egyptian plan at once suggest an architecture of solemnity and mystery, in which the whole plan is an anti-climax, and the mystery narrows and closes round us the further we penetrate into the recesses of the buildings. How striking it is, too, to compare the typical plans of the Egyptian, the Greek, and the Gothic temple! Is not the prevailing character of the religions to which they are dedicated expressed in the three plans? The Egyptian the plan of mystery, closing in the more as you enter it, and showing nothing externally but the entrance pylons and a blank wall; the Greek the plan of rationalism—a columnar display on the exterior, and a wide interior plan neither enlarging nor diminishing as you enter it; the Gothic the plan of aspiration, widening and enlarging to its inner and more sacred extremity. Even in comparing the archaic Greek temple with the Parthenon, we see the progress from the long narrow *cella* of Selinus to the broader one of the Parthenon, significant of the development in the direction of a more cheerful and rational religious rite.

The three types of plan referred to just now tell their own tale as to roofing. The Egyptian and Greek plans are manifestly the plans for flat roofing; the small inner apartments in the Egyptian plan might be vaulted, but there can be no sense in the forest of columns distributed over the floor of the larger halls except to uphold a flat roof; and the Greek *cella* shows no abutment for an arched roof. The Gothic plan, on the other hand, proclaims the preparation for the arched roof; we see the change in the walling, from Romanesque to Gothic, as the vault is adopted and the masses of wall pivot about and take their stand at right angles to the thrust of the roof.

As an example of the crude fashioning of a plan without any order or any dominant idea, and also of the effect of roofing upon plan, we may take Khorsabad. This is a mere warren of straggling apartments grouped on no system; it is true that this was a palace for habitation, not a temple; but why are the rooms all long and narrow? Because they were roofed by a crude system of vaulting, erected without centering, and which could not be carried out over a wide space. This is essentially an uncivilised plan; what a difference when we turn to the plan of Spalato, with its wide spacing and symmetrical arrangement! In this latter point, however, it is surpassed by the plan of the Escurial, in which the great church, which is the prominent feature, is more centrally placed than the temples at Spalato, giving a greater effect of climax. The architecture of the Escurial, it is true, is cold and uninteresting; Herrera had laid his deadening grip over the classical revival in Spain; but the plan is a magnificent one—almost inspiring in its very appearance, and it might be built over again as one of the finest things in the world. It would not be a bad subject for the Tite Prize, to give the competitors the plan of the Escurial and the mission to treat it in the best Italian manner they could. Another example of a great plan is Inigo Jones's Whitehall Palace, one of the finest schemes for a great palace that has ever been conceived, like the Escurial, impressive even on paper; notice especially the splendid idea of the columned circular gallery as the State approach to the private apartments of the Sovereign; an idea unique, as far as I know, in architecture. If anyone objects (as many certainly would have objected thirty years ago) that the executed portion of the building is too cold and formal in style, I reply that that does not affect the grandeur of conception of the plan. But, in fact, Inigo Jones's severe and scholarly style of classic architecture was exceedingly suitable to the dignity of a great royal palace, and had his design been carried out, London would have possessed the greatest Renaissance building in the world.

A Spoilt Opportunity.

One has only to turn to the plan of Versailles to see how an architect who was not a great genius could spoil an even finer opportunity. For a great royal château Versailles has an absolutely ideal position, with the great courtyard rising with a gentle slope up to the entrance front, and the other façade overlooking from a wide terrace the finest park in the world. But there is



Versailles. Plan of Palace, Park, and Gardens.

out of sympathy with what may be termed the "ratepayer" argument. This form of limited competition must not be confused with the more legitimate one where architects are selected for their experience in the class of work proposed; with regard to this, no objection can be raised, provided the selection is made with the concurrence of a qualified professional adviser, so as to eliminate the exercise of methods inimical to the cause of architecture and the dignity of its exponents.

Practical Structural Mechanics.

DURING the past few years ferro-concrete, steel frame building, and other more or less novel methods of construction have made great strides, and constantly challenge the skill and constructive ability of architects and builders; but it is an unfortunate fact that the vitally important subject of structural mechanics, associated as it too often is with half-understood formulæ, which produce doubtful results after much tedious mathematical labour, should still remain to a large extent highly uncongenial to students, and even more so to men in practice. For the past three years Professor Lethaby has been making a strenuous effort at the Architectural School of the London County Council Central School of Arts and Crafts, Southampton-row, to render this subject more attractive to building and architectural students by the substitution of practical experimental work and tests for the mathematical deductions of the average text-book. The formulæ and rules in ordinary use are first explained in class by an experienced engineer in simple terms and built up from first principles, and then applied to practical problems of design. The students are then encouraged to prove all their results and deductions by means of models and apparatus upon which the actual stresses and strains induced by different loadings can be clearly seen and accurately measured. The course is as comprehensive as can be desired, including the calculations and design of beams, floors, roofs, columns, arches, walls, shoring, and all problems likely to arise in actual practice; but no mathematics higher than simple equations are employed, and arithmetical work is reduced to a minimum by the employment of graphic statics and the slide rule. That the system is a success has been shown by the fact that students sitting for the Royal Institute of British Architects' examinations have been congratulated by the examiners upon their clear grasp of the subject and by significant evidences of interest in the students themselves—busy men sometimes making every possible attendance over a session of no less than nine months. A separate advanced class is now being formed, in which the work consists entirely of the working out in class of examples of advanced structural design, including large wood and steel roofs, domes, ferro-concrete beams and columns, etc.; and opportunity is given to the students to use the experimental apparatus for the proof of any doubtful point. An article in our current issue by the lecturer is an example of the simple explanations adopted those particular *bêtes noires* of the architect, moment of inertia and radius of gyration, being defined in terms which any intelligent schoolboy could grasp. We wish Professor Lethaby every success in the work, and strongly recommend to our London readers the support of the course.

Paris Fire Brigade.

IN spite of improvements in the appliances at command of the London Fire Brigade lessons may still be learned from abroad and put into practice at home by those responsible for the equipment of the service in question. Going no farther afield than Paris, for instance, we find evidences of progress fully deserving attention. Long known as one of the most efficient fire brigades in the world, the Paris *service d'incendie* is now being re-equipped with petrol-driven fire engines, fire escapes, and salvage vans, and all horse-drawn vehicles are being pensioned off. The engines, escapes, and vans are mounted on *chassis*, propelled by 50-horse-power petrol motors, which in the case of fire engines are arranged so as to actuate either the wheels or the pumps, the latter being of the compound centrifugal type, each capable of delivering 230 gallons of water a minute at the pressure of about 150 lb. per square inch. There is much to be said for re-equipment in accordance with a comprehensive scheme, instead of adding new apparatus piecemeal, as generally happens in this country.

THE SKETCH SOCIETY.

THE Sketch Society has provided a very pleasant exhibition of oil paintings and water-colour drawings at the Royal Institute galleries. The works of each exhibitor are hung together, so that we have a number of small, independent groups of works; and there is much to be said for this sort of arrangement. It is simple, it is not ineffective, and it enables you to form, without dodging about from one part of the galleries to another, some coherent estimate of the versatility or lack of versatility, or perhaps the general aim, of any given painter's work. Decoratively, this kind of arrangement would seem to compare favourably with exhibitions where the work of individual painters is scattered. If you take a large exhibition, like that of the Academy, the attempt to arrange the pictures with any decorative principle in view would seem to become more hopeless every year. The mass of pictures to be dealt with would, in any case, make the task a difficult one. By grouping together the works of individual painters a certain unity of idea is preserved; and this, after all, makes for unity of impression—an essential factor in any decorative scheme.

The pictures of the Sketch Society, as suggested by its title, do not aim at any ultimate accomplishment. But there is much to be said for the *raison d'être* of such a Society, and we might even wish for work of a less elaborate finish than in many cases appear on the walls. A sketch is a first impression: the immediate translation of the artist's idea into the vocabulary of his art, with the blotting out, hesitancy, and quick revision of line and colour which usually go with thought in the making. However imperfect the result may be, it more often than not contains some pleasant, spontaneous touches which are often lost when a more deliberate achievement is attempted. The artistic and marketable value of a sketch is, we fancy, at times under-rated. The present view of painting insists upon patient elaboration and revision. But, as we know, in the arts of verse and prose elaboration and revision have been more or less impossible to a certain order of mind. A good deal depends upon the temperament of the artist. Byron, for instance, declared that he could only arrive at poetic expression at one spring, or not at all. That is to say, that he never really advanced beyond the "sketch" stage. But there is something to be said for this spirit of fine impatience, and Byron, after all, counts. Why should not the same sort of temperament count in the graphic arts? But perhaps it does. There is Mr. Brangwyn, who is certainly of the Byronic order.

But Mr. Brangwyn is not represented at the present exhibition. There is, however, the quieter method of Mr. Monk, who is here certainly represented at his best. We have not always been in sympathy with this artist, but here he is lively and imaginative, sketchy and extremely effective. Mr. Charles Dixon, also, in his various scenes of shipping of yesterday and to-day, provides a group of quite effective sketches. The work of Mr. Alfred Gilbert is on a broader plane, but it has the quality of immediate impression. And there are the pictures of Mr. Terrick Williams, Mr. David Green, Mr. Basil Woodhouse, Mr. J. Herbert Snell, and many others which call for mention in this respect.

Without, however, attempting to distinguish the qualities of the various artists (there are some 600 pictures) who are mostly content with a formula of British art with which we are all familiar, let us say that the general level of the exhibition is by no means inconsiderable. There are, indeed, many pictures which suggest poetic and imaginative gifts. There are others which show a distinct appreciation for painting in its decorative aspects, and here and there, although rarely, we find a drawing indicating that the artist has some understanding of the pictorial treatment of architecture. 'Tis a modest exhibition, but quite a pleasant one.

ARCHITECTURE AS PLAN AND SECTION.

AN ordinary general meeting of the Architectural Association was held on Monday, at No. 18, Tufton-street, Westminster, S.W., the President, Mr. Arthur Keen, in the chair.

The minutes and nominations having been read and confirmed,

Mr. Raymond Unwin and Mr. A. O. Hector were elected as members.

The President, having announced the reinstatement of Mr. A. S. Dorrell, proposed a vote of thanks to Mr. J. Macvicar Anderson for a donation to the Library of two volumes of the *Builder* for 1910. This was agreed to.

He also made the following announcements:

The first Spring Visit on Saturday, January 21, to the Law Courts extension, by permission of Sir Henry Tanner. Members to meet at the building at 2 p.m.

An all-day school visit on Friday, January 13, to Colchester.

Mr. H. H. Statham then read the following paper on

ARCHITECTURE AS PLAN AND SECTION.

"Many years ago there appeared in the *Westminster Review*, in the days when that periodical was an intellectual power in the land, a remarkable article on "Winckelmann and Greek Art," which to some extent coloured my feelings about art for the rest of my life. The author, as I learned long afterwards, was Walter Pater, and the article was probably his earliest essay on æsthetic subjects. In the course of it, speaking of the distinction between architecture and the arts of sculpture and painting, he said:—

"The arts may thus be ranged in a series, which corresponds to a series of developments in the human mind itself. Architecture, which begins in a practical need, can only express by vague hint or symbol the spirit or mind of the artist. He closes his sadness over him, or wanders in the perplexed intricacies of things, or projects his purpose from him clean-cut and sincere, or bares himself to the sunlight. But these spiritualities, felt rather than seen, can but lurk about architectural form as volatile effects, to be gathered from it by reflection; their expression is not really sensuous at all. . . . Architecture is the mode in which the artistic effort centres."

Here was a totally abstract conception of architecture, as the walling up and covering in of a space, and as capable of poetic expression from that point of view alone, independent of any considerations of style or detail. That sentence, "He closes his sadness over him, or wanders in the perplexed intricacies of things," has haunted me ever since. If you come down to the primary elements of architecture, does it not consist in laying out a plan in an effective manner, and in covering in that plan in a manner at once effective and structurally sound? I am asking you to consider architecture this evening from that point of view. There is a moral connected with it; but the moral, according to traditional usage, comes at the end.

Roofs and Plans.

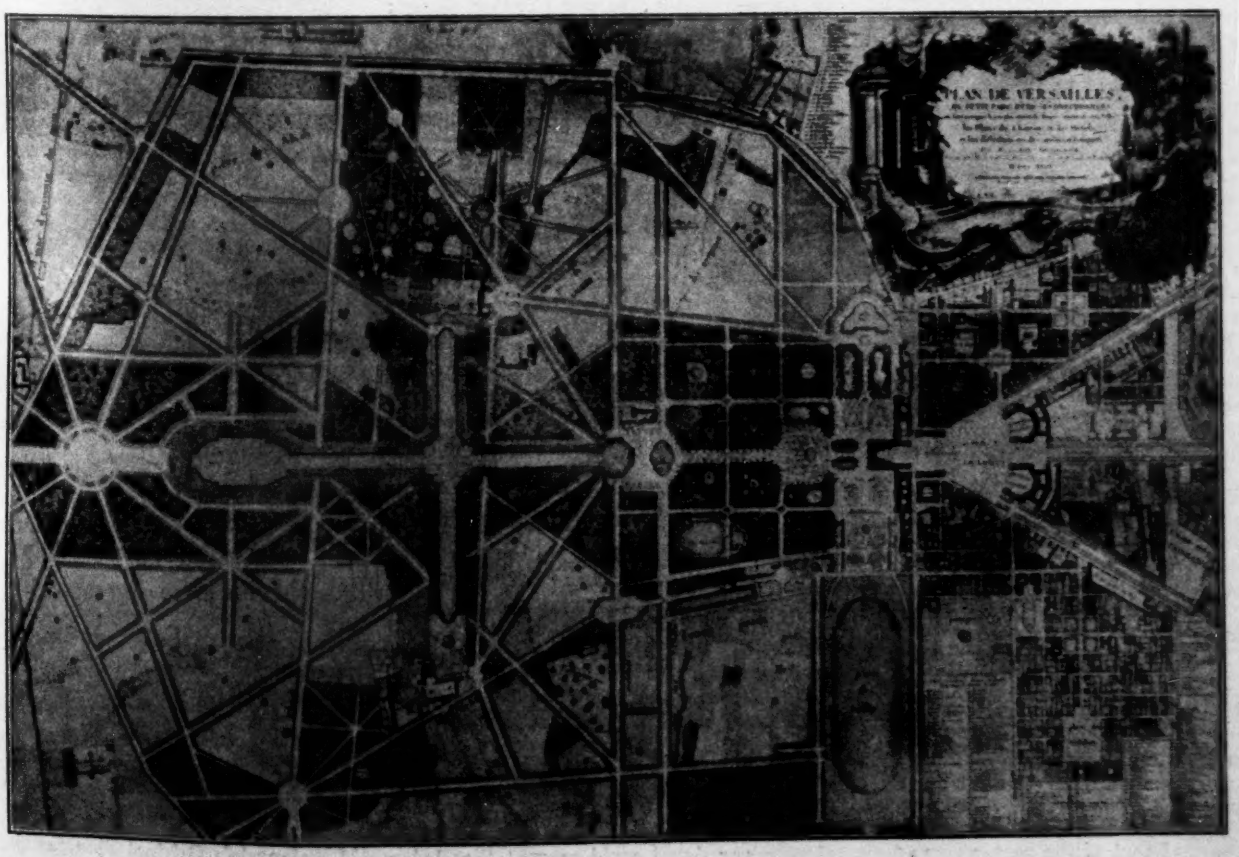
No architect worth the name ever lays out a plan without having present in his mind at the same time the manner in which he means to roof it in; and the mere aspect of a plan on paper at once sets the mind thinking as to what the section of the building would be. But even apart from that consideration, a plan, merely as plan, has its own expression and its own suggestiveness. Does not the typical Egyptian plan at once suggest an architecture of solemnity and mystery, in which the whole plan is an anti-climax, and the mystery narrows and closes round us the further we penetrate into the recesses of the buildings. How striking it is, too, to compare the typical plans of the Egyptian, the Greek, and the Gothic temple! Is not the prevailing character of the religions to which they are dedicated expressed in the three plans? The Egyptian the plan of mystery, closing in the more as you enter it, and showing nothing externally but the entrance pylons and a blank wall; the Greek the plan of rationalism—a columnar display on the exterior, and a wide interior plan neither enlarging nor diminishing as you enter it; the Gothic the plan of aspiration, widening and enlarging to its inner and more sacred extremity. Even in comparing the archaic Greek temple with the Parthenon, we see the progress from the long narrow *cella* of Selinus to the broader one of the Parthenon, significant of the development in the direction of a more cheerful and rational religious rite.

The three types of plan referred to just now tell their own tale as to roofing. The Egyptian and Greek plans are manifestly the plans for flat roofing; the small inner apartments in the Egyptian plan might be vaulted, but there can be no sense in the forest of columns distributed over the floor of the larger halls except to uphold a flat roof; and the Greek *cella* shows no abutment for an arched roof. The Gothic plan, on the other hand, proclaims the preparation for the arched roof; we see the change in the walling, from Romanesque to Gothic, as the vault is adopted and the masses of wall pivot about and take their stand at right angles to the thrust of the roof.

As an example of the crude fashioning of a plan without any order or any dominant idea, and also of the effect of roofing upon plan, we may take Khorsabad. This is a mere warren of straggling apartments grouped on no system; it is true that this was a palace for habitation, not a temple; but why are the rooms all long and narrow? Because they were roofed by a crude system of vaulting, erected without centering, and which could not be carried out over a wide space. This is essentially an uncivilised plan; what a difference when we turn to the plan of Spalato, with its wide spacing and symmetrical arrangement! In this latter point, however, it is surpassed by the plan of the Escurial, in which the great church, which is the prominent feature, is more centrally placed than the temples at Spalato, giving a greater effect of climax. The architecture of the Escurial, it is true, is cold and uninteresting; Herrera had laid his deadening grip over the classical revival in Spain; but the plan is a magnificent one—almost inspiring in its very appearance, and it might be built over again as one of the finest things in the world. It would not be a bad subject for the Tite Prize, to give the competitors the plan of the Escurial and the mission to treat it in the best Italian manner they could. Another example of a great plan is Inigo Jones's Whitehall Palace, one of the finest schemes for a great palace that has ever been conceived, like the Escurial, impressive even on paper; notice especially the splendid idea of the columned circular gallery as the State approach to the private apartments of the Sovereign; an idea unique, as far as I know, in architecture. If anyone objects (as many certainly would have objected thirty years ago) that the executed portion of the building is too cold and formal in style, I reply that that does not affect the grandeur of conception of the plan. But, in fact, Inigo Jones's severe and scholarly style of classic architecture was exceedingly suitable to the dignity of a great royal palace, and had his design been carried out, London would have possessed the greatest Renaissance building in the world.

A Spoilt Opportunity.

One has only to turn to the plan of Versailles to see how an architect who was not a great genius could spoil an even finer opportunity. For a great royal château Versailles has an absolutely ideal position, with the great courtyard rising with a gentle slope up to the entrance front, and the other façade overlooking from a wide terrace the finest park in the world. But there is



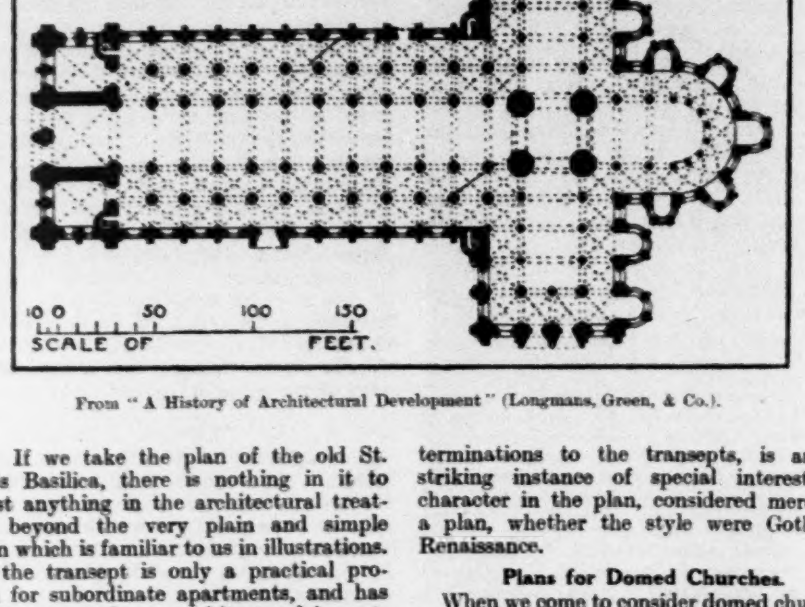
Versailles. Plan of Palace, Park, and Gardens.

nothing great about Versailles except its situation. The detail is dull and mechanical; but even were it better the treatment *en masse* would have spoiled it. This largest palace in the world is entered in a corner, and does not contain a single staircase of spacious and monumental effect, and half the effect of the park façade is lost by the blunder of bringing out the centre block in an immense projection, so that from no point of view can one get the effect of the whole length of the façade. A very long façade may be accentuated in the centre by a slight projection, but to thrust a great mass of building out from the centre is fatal. Any projections on such a scale should be at the wings, not at the centre.

Versailles, in fact, is an immense plan with no leading or dominant idea except that of mere size. For a large plan to suggest anything impressive in the design, as a whole, there must be a dominating feature in plan which suggests a dominating feature in section. If, for instance, that square projection in the park elevation of Versailles had been a great hall crowned by a dome which would be seen from the park, as the principal object, the remainder of the building forming a background to it on the second plane, there would have been some reason in it; as it is, there is no recognisable motive. It is the same generally with any form of plan which appears to have no suggestion for special treatment of any portion of it. The Egyptian columned halls, as already observed, naturally suggest a flat roof; the one point of effect suggested is in those hypostyle halls which have the two ranks of larger columns down the centre; there we at once expect some such sectional effect as is supplied by the clear-story lighting above the smaller columns. In such a plan as that of the so-called Hall of Xerxes at Persepolis, with equally spaced columns all over the floor, there is no suggestion for any effective design in section; it is obviously a flat-roofed building, which may have had, as shown in Mr. Spiers's restoration, a general expression of palatial magnificence, but with no one point to attract the eye more than another; it hardly represents an architectural thought at all; it is an architecture of mere interior display. The typical plan of a mosque, as seen in the plan of Ibn Touloun, is an example of another kind, of the equal distribution of points of support with no leading feature. This was for practical reasons. A mosque, it must be remembered, is not a temple in honour of the Deity; in the Mahommedan creed, "the Most High dwelleth not in temples made with hands"; it is simply a shelter and a place of seclusion for the worshippers, who especially congregated at the inner end of the enclosure, to pray in the direction of Mecca; consequently this portion was to be completely covered in, but for practical, not for architectural reasons; so that the equal distribution of points of support supplied all that was wanted. At Cordova the idea was carried further, and the whole area covered in, with great richness of decorative treatment; but the idea was still the same; it is a shelter, not an architectural temple. After the Turks took Constantinople in the XVth century, and converted Hagia Sophia into a mosque, they got tempted by the grandeur of this building into giving a new architectural grandeur to their mosques; but the mosque originally was merely a shelter, and was designed as such, and consequently presented no basis for a great and complete architectural conception.

Church Planning.

In the Christian church there was from the first a leading idea in the special importance and sanctity of the east end (using the word in its ritual sense, for many of the Italian churches were not orientated). But the plan and section of the early Basilica church suggested no special architectural motive beyond that of the perspective effect of a colonnade or arcade leading up to the



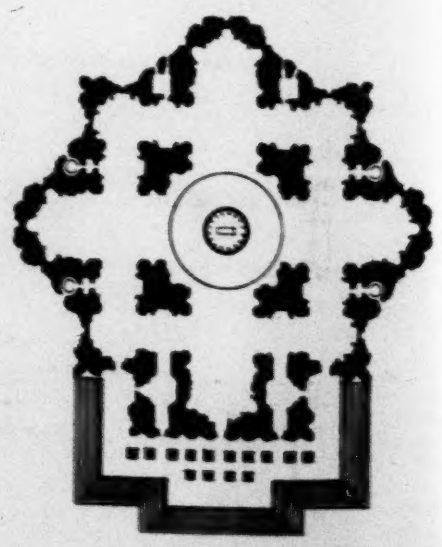
From "A History of Architectural Development" (Longmans, Green, & Co.).

apse. If we take the plan of the old St. Peter's Basilica, there is nothing in it to suggest anything in the architectural treatment beyond the very plain and simple section which is familiar to us in illustrations. Here the transept is only a practical provision for subordinate apartments, and has not yet assumed any architectural importance. With the development of the choir and transepts the crossing became architecturally the dominant point of the design. As Fergusson quite truly remarked, the weak feature in the mediæval plan was that this central space was so small. Its accentuation in section clearly pointed to the employment of a high and towerlike structure, since the width was not sufficient for effect with anything in the shape of a domical covering. The architect of St. Sernin at Toulouse, in the Romanesque period, hit upon the real way to treat it with the class of detail in use at that time. The introduction of the octagon crossing plan at Ely was a manifest improvement in this portion of the plan, and the design of the exterior lantern (though unfortunately not in monumental stonework) just expresses it; in this case a central spire would be out of place and contrary to both plan and structure. In England we have always retained the practice of treating the crossing as the point to be accentuated in the exterior design; an advantage which the French for the most part lost through their passion for internal height, which rendered any great erection on the crossing too dangerous. It is a question whether the more limited height of our cathedrals, with the advantage of the central tower and spire, did not produce better and more interesting architectural results.

Though the finest of the French cathedral plans are superior to the long narrow English plan, in their effect of climax, as at Rheims, produced by the widening of the plan towards the east end, there is perhaps a greater variety of interest and suggestiveness in the English cathedral plans. And here we again come to see that the plan of a cathedral is in itself significant of the character, of the greater or less architectural interest, of the building. Bourges, for instance, is an uninteresting and prosaic plan, with no specially suggestive point. We cannot look at the plan of Florence Cathedral, with its bare, wide spacing of the piers, without instinctively feeling in it something of the hard, unsympathetic character of Italian Gothic, as compared with the more rich and picturesque character of French and English Gothic. Sometimes, again, we come on a plan which represents a distinct and uncommon idea, quite apart from the general type; as, for instance, at Charroux, with its remarkable choir on a circular plan. A still finer instance, and more suitable, too, for the ritual use of the church, is the grand plan of St. Gereon at Cologne, with its elliptical nave and the long choir opening out of it. Hardly any detail could prevent that being a fine interior. Tournai, with its apsida terminations to the transepts, is another striking instance of special interest and character in the plan, considered merely as a plan, whether the style were Gothic or Renaissance.

Plans for Domed Churches.

When we come to consider domed churches, we recognise that, in connexion with plan, they fall into two classes—those in which the dome is the main covering of the whole or the greater part of the centre of the area, and those in which it is the accentuation of a special open space which forms only a portion of the plan. This sheet of plans of domed churches of the former class affords a remarkable illustration of the manner in which plan forms an element of design. Every one of those plans represents in itself a distinct architectural idea, each suggestive of a different section, and each capable of very varied treatment in detail. San Vitale is a celebrated church of this class, which has, to my thinking, the drawback that no exterior dignity is obtained from the central dome; it is practically an internal architecture only, a defect which it shares with the greater Byzantine church at Constantinople. With all that provision for buttressing on the plan of San Vitale, something more might surely have been done with it than merely to build a thin dome as an interior shell, with a low-pitched roof over it. A magnificent example of the central dome plan is the church of the Madonna di Vico in Piedmont, which was, I believe, little known until a few years ago an enthusiastic admirer, Mr. Melano Rossi (an American with an Italian name) published a history and illustrations of it. The plan promises such splendid opportunities of effect that one gets a kind of inspiration from the mere sight of it. The plan was that of an Italian



Michelangelo's Original Plan for St. Peter's, Rome.

engineer officer, Captain Vitozzi, who commenced the building in 1506, but it was not covered in till more than one hundred years after, by a young architect named Francesco Gallo; as in the case of St. Peter's, the doming over of the central area seems to have frightened two or three architects before it was finally accomplished. Whether all was done with so fine a plan as might have been accomplished may be a question; some of us may think we could have done better than that; and I should certainly like to know how Francesco Gallo managed to plant that large lantern on the top of this rather flat dome without coming to grief. It has stood, however, for three centuries.

The plan of St. Peter's as intended by Michelangelo is of some interest, for it shows how much better a composition would have resulted if the building had been let alone instead of being lengthened out by Carlo Maderno. We should then have seen it as a pyramidal composition of which the dome was the main feature, instead of the dome being relegated to a back position in the composition, as seen on approaching the entrance façade. One weakness in Michelangelo's plan, however, is that he has not made as much as he might have done of the apses to the transepts and choir; they are rather timid in line and proportion; we realise this at once on comparing it with Sangallo's plan, which in this respect is much bolder and finer. Why Michelangelo, who was perfectly acquainted with Sangallo's design, should have chosen this less bold and effective treatment is perhaps explained by the fact that he was determined, whatever he did, to differ from Sangallo.

In considering the dome as the roofing of a special portion of the plan, one has to distinguish between the case of a single dome and those in which more than one dome is used. A single dome must, of course, be the covering and the accentuation of the most important portion of the plan. Where more than one dome is introduced, it may be laid down that a dome is essentially a form to be employed in a square or transeptal form of plan, and not in a plan in long perspective. At St. Mark's and at St. Front, Périgueux, which probably drew its inspiration from St. Mark's, we see a principal dome at the centre, with subordinate domes grouped around it, each one the roofing of a square compartment; a perfectly suitable application of the feature. At such a church as Angoulême, a long church with a series of domes, the dome is a less suitable feature; the succession of domes interrupts and breaks up the perspective rather than assists it. The vault is the suitable form of roof for the long church, the dome for that which is developed from a square plan. Wren's first design for St. Paul's was, both internally and externally, the single-dome design, a great central space covered by a great dome. Taken as a whole, it is a far finer conception than the existing building, though in detail the model may not be in all respects equal to the latter; at all events, it shows nothing so charming as the present western towers. Externally, St. Paul's is still the single-dome design, but internally it is roofed by a series of smaller domes. I think it is impossible to turn from the original plan to that of the existing church without feeling that we are in presence of a plan very much inferior to the first one; a feeling in which I think Wren would have entirely concurred.

Plans for Secular Buildings.

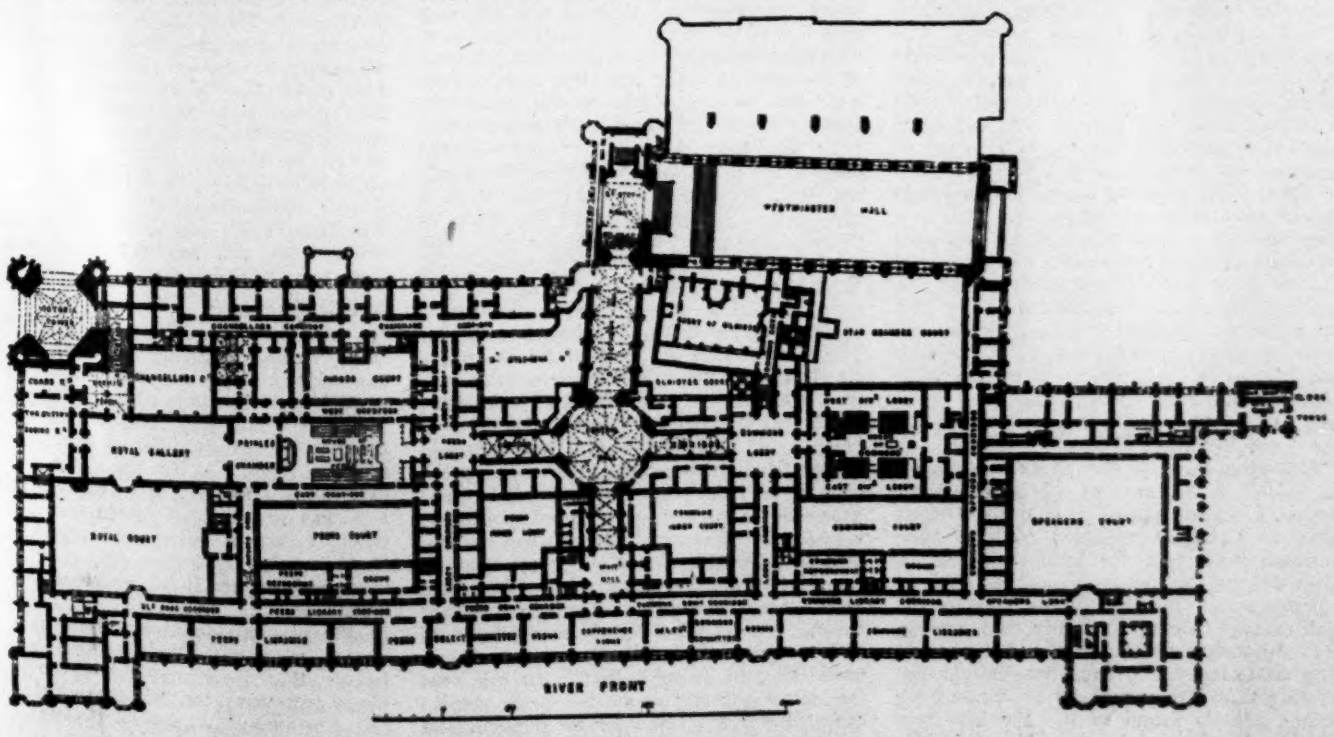
The importance of the element of plan is nowhere better exemplified than in the Houses of Parliament. There was a foolish controversy a good while ago as to whether Pugin or Barry ought to have the credit of the building, on the supposition that the Gothic detail was Pugin's. I doubt if the exterior detail was Pugin's, though he no doubt designed a great deal of the interior work. But the controversy was entirely beside the mark; the detail is the weakest part of the building. Its greatness consists in the grand simplicity of the plan, the centre octagon with the main corridors leading right and left to the two chambers, and in the great exterior composition of the two contrasted towers and the central lantern marking the position of the octagon; the detail is a secondary matter altogether. That plan has been copied in buildings of a similar class all over the world. The Budapest Parliament is almost a direct copy of it, with one additional point which our building wants—that the position of the two chambers is shown in the exterior design. Another example of a plan formed on similar lines is Mr. Ernest Flagg's fine competition design for the State House of Minnesota.

St. George's Hall at Liverpool is a fine example of a great comprehensive plan, the architect's intention in which was not altogether realised in execution. Elmes's idea was that the great central hall was to be a *salle des pas perdus* for the two law courts, which were to be at opposite ends of the hall, divided off only by curtains, and that there was to be a vast vista, at the opposite ends of which were to be seen the two judges sitting in state. Whether that would have conduced to the convenience or comfort of the courts was a question on which I am afraid Elmes did not trouble himself much; he thought only of a great architectural effect, and he was perfectly mad when he learned that his vista was to be closed at one end by a great organ-case. But it certainly was a grand architectural conception, whether convenient or not.

Among plans for public buildings Bernini's plan for the great court of the Louvre is of some interest, from the effective manner in which he proposed to treat the re-entering angles of the quadrangle, by bringing them out and accentuating them in the manner you see on the plan. The inner angles of a great quadrangle are apt to be weak points in the plan, and Bernini's way of treating them is worth attention. To come to an existing example of well-thought-out and practical planning there are few better things to be seen than the planning of the Birmingham Law Courts, by Sir Aston Webb and Mr. Ingres Bell; I believe the actual plan was Mr. Bell's personal work. It answered, I believe, all the requirements of the promoters, and you see how perfectly simple and straightforward and symmetrical it looks; but that kind of simplicity is not attained without much thought and trouble. There should be a centralisation, a backbone as one may say, in the planning of a public building. As an example of the contrary, you may take an excerpt from a competition plan for a public building, fortunately (as far as the plan was concerned) not carried out. The visitor going straight through the entrance porch is faced by a blank wall; or he may turn to the left and then to the right again to reach the crush-room through an arcade, the openings of which are not central with anything whatever. As exterior architecture the design was a fine one, but I confess I cannot understand an architect making such a plan as that.

English Mansions.

Some of the old Renaissance mansions show the peculiarity of a close approach to symmetrical planning, but just missing it; Longleat is an example. It looks as if it had been meant for a symmetrical plan but



HOUSES OF PARLIAMENT, WESTMINSTER, S.W.

(From "The Life and Works of Sir Charles Barry.")

had been drawn out in a hurry and wanted correcting. Blenheim shows the element of stateliness in planning carried, one might say, to an extreme; but in justice to Vanbrugh it should be remembered that Blenheim is what may be called a palace rather than a mere mansion; and in a palace, which is nothing if not stately, stateliness may excusably be put before convenience. The symmetrical mansion plan, however, is apt to be a danger unless the interior arrangements will lend themselves to it. The next plan I show consisted, I believe, of wings added at each end of an old mansion, but the recessed portion between the centre and the wings is, on the right hand, the end of a large picture-gallery, on the left hand it conceals some small rooms connected with the service. Some people may think that does not matter so long as exterior symmetry is preserved, but it seems to me rather a false method of planning. There is a plan by Mr. E. J. May, additions to Jardine Hall, which I have always admired, and which shows how a very stately effect may be given to an interior of a mansion on not a very large scale. By placing the dining-room and drawing-room at opposite ends of the house, connected by a wide corridor over 100 ft. in length, he has provided for a kind of state procession from the drawing-room to the dining-room, giving the guests the impression of being in a larger mansion than they imagined. The only thing I complain of is that I think the mantelpiece projection in the dining-room, which would probably be of a monumental character, should also have been placed on the central axis of the corridor, so as to complete the vista from end to end.

As a warning, on the other hand, I may call attention to an extraordinary piece of planning taken from an actual (not recent) house. The drawing-room is cut into in a most awkward manner by a kind of promontory, the corner of which faces, not an answering pier, but the middle of a bay-window, the men's lavatory is close to the dining-room door, and the door faces the hall and staircase in the most unblushing manner; the way for the dinner from the kitchen is across the hall and past the lavatory door; and the window of the servants' hall is so placed as to overlook all visitors on their way up to the hall door. Those are certainly things to be avoided.

As a modern example of a plan which is in itself a new architectural idea, I would cite the building at Paris called the "Petit Palais" (though it is really a very large building), by M. Girault. This is entirely an original conception in plan; the front block forming a great straight gallery with a dome over the centre, the remaining portion of the plan forming two ranges of galleries one within another, the inner line of the building forming a semicircular loggia round an interior garden court. This is a piece of real invention in architecture, such as we do not often meet with. The principal façade is a very stately design, and the semicircular façade towards the garden is a very graceful example of the modern French type of classic architecture. But, as with our Houses of Parliament, the plan is what gives the building its real value.

Public Offices in Whitehall.

Referring again to the idea that plan is in itself an expression of architectural design, I would suggest that even a block plan may be so regarded. When, some fourteen years ago, the Institute of Architects did me the honour to ask me to read a paper on the question of the sites for the Government Offices, I put my own idea on the subject into a block plan, which received such flattering notice from speakers at the meeting that I may perhaps be excused for feeling a little proud of it. My idea was that the Admiralty (*a*) was to be completed, as three sides of a quadrangle, the First Lord's house (*c*) forming a central object on the fourth side of the quadrangle, with a screen colonnade on each side of it. The War Office (*b*) was to face the Admiralty with a somewhat similar quadrangle, and the Commander-in-Chief's residence, or his Staff Offices, responding to the First Lord's house. An important sculptural war monument would occupy the centre of the roadway between them. All the west side of the street north of the Admiralty was to be set back so as to render it the same width all the way up, and bring the axis of the street to join the centre axis of Trafalgar-square at a point marked by the Charles I. monument, which would only require to be shifted a few yards to come into the scheme. That was what I thought might have been done if the Government could have been persuaded to spend money to do the thing on a grand scale, worthy of the nation. An important point in my mind was that a great national building of this kind should make a place for itself, and not merely follow the street lines. The French Government would have realised that; our Government only considers economy of building land, and so the War Office has actually been built in an irregular shape following the street lines, as if it were only a monster hotel which was to make the greatest commercial return out of every yard of ground. My suggestion was, of course, hopeless with an English Government, and never went further than the block plan; but I think you will admit that the plan constitutes an architectural idea.

And now for the moral. We have stretching for a century behind us the battle of the styles, less active and exacting now than it used to be, but still not by any means extinct. Most of us are still troubled with searchings of heart as to which style is the right one for permanent adoption; one of the considerations in working out a design for a new building still is—consciously or unconsciously—"What style shall it be in?" I am proposing to deliver you from all this, once for all, by recommending you to adopt a view of architecture in which detail, in a sense, does not matter. Professor Lethaby some time ago proposed that we should solve the problem by hunting down, as he expressed it, all the accepted detail, and beginning again with no details or mouldings, and see what we arrived at. I think that is rather too stern a gospel for general acceptance, and moreover that we are much more likely to come on interesting and original detail by developing on traditional lines than by evolving detail out of our inner consciousness. What I want to suggest is not, of course, that good detail is of no consequence, but that, provided it is good of its kind, it really does not matter what kind you adopt, so long as the main conception of the building is a fine and effective one; and that the effect of most of the great existing buildings of the world depends on their general conception, and is to a great extent independent of the style of detail. Take, for instance, the plan and section of Palladio's church of the Redentore. That is a church with a series of deep side chapels, and a dome covering the centre space between three semicircular tribunes. The side chapels are divided by decorative classic columns, but you know well enough that those are not essential but accidental; the essential conception is a series of deep bays at the sides of the nave, and a domed centre flanked by semicircular spaces; the columns and the other classic details are not necessary to it; the same general conception might have been carried out with half a dozen different forms, and still have retained its essential character, and remained a fine architectural conception. Or take the Pantheon, one of the finest conceptions in architecture; what has the classic detail, essentially, to do with that? In this case the detail actually spoils the main result; the Order is too small for its position and seems crushed by the superstructure. The plan and section, in other words the same leading idea, might have been carried out with much finer effect with a detail entirely different from this. Or, to refer once more to the great building which is nearly within a stone's throw of us, I put it to you that if, by the wave of an enchanter's wand, you could in a moment transform all its Tudor detail into Renaissance, the Houses of Parliament, in all the qualities which make its real architectural greatness, would still remain just what it was, and its claim on our admiration would be in no way affected. In short, the delivery from all this imaginary bondage of styles lies in the recognition of the fact that the essential element in architecture is the embodiment of an idea expressed in plan and section."

M. Maurice B. Adams,
in proposing a vote of thanks, said he was glad Mr. Statham had taken so high and monumental a view of things, for we seemed to be degenerating considerably. When he looked at the work the Royal Academy students were doing at the present day, he could not help thinking that we did not possess the same high ideals that we used to have. Street's drawing of the Law Courts, which had always struck him as one of the masterpieces of the XIXth century, reminded him of that, and as the Association had obtained that drawing, he wished they could secure Burgess's conception for the same work. We seemed to flounder, as a rule, now, and did not keep to the high ideals of the authors of most of the work they had seen illustrated that night. Whether drawing had anything to do with it he did not know, but it seemed to him that drawing was getting exceedingly theatrical and made, perhaps, with a view of attracting attention. There was an indulgence in a variety of colouring and rococo ornamentation which was not conducive to high architectural effort. He wished that more sections had been shown, because it was the section one had to keep in mind in planning a building. In most of the important competitions the successful plan was generally by the man who contrived the subordinate parts of the building without destroying the general lay-out of the scheme. He realised this in the case of a comparatively small competition at Hammersmith, in the way Mr. Hare, who was the successful competitor, got his storage. An unambitious aspect of the subject occurred to him in thinking of the houses which Mr. Norman Shaw had built. There was one at Kensington in which the section and plan were exceedingly ingenious. At Queen's Gate, again, it would be seen how Mr. Shaw managed the staircases and the subordinate part of the house, which fell into their place in a very convenient way. He agreed with Mr. Statham as to the magnificent lay-out of the Houses of Parliament. He thought that Pugin had a large share in the production of the elevation of the design, but the conception of the whole thing was Barry's without doubt, for in Barry's other work one saw the same masterful thought.

Mr. Gerald Horsley
seconded the vote of thanks, and referred to the value of studying plans. In sketching excursions, plans of nearly all buildings visited could be made with advantage. The plans were not only interesting to look at afterwards, but they helped one greatly in making them. As to what Mr. Statham said in his moral that detail did not matter; this was no doubt right in considering a whole series of plans and sections. Mr. Statham also said that plan and section were architecture in its elements—the real spirit of the building being expressed in the plan and section. This he wholly agreed with, but Mr. Statham went on to say that it did not matter so long as the detail was good what the detail was. [Mr. Statham: "What kind of detail."] He did not think he could agree with [Mr. Statham, for what was the real state of things when making a design? They tried to get a good plan, and then they passed

on to the making of the drawings of the elevations and sections. It was comparatively easy, so long as the drawings were to a small scale, but the difficulty of the architect nowadays began when he came to the details of the building—½-in., 1-in., and full-size. It would not be right to say that everything depended upon the detail, but Mr. Statham himself had shown how much depended on the detail in his description of the Redentore and the Pantheon. He thought the detail of a building should be as much an integral part of it as the plan and section. Mr. Statham mentioned that the plan of the Houses of Parliament could have been expressed in terms of Renaissance architecture quite as well as the Gothic which we knew, but surely that was because the plan was really a Renaissance plan—designed by Barry, who was trained in Renaissance principles; but he did not think any of them would like to see the exterior of the Houses of Parliament different from what it is. Again, one would not be satisfied if the exterior of St. Paul's had been designed by another hand—if the detail had been designed by someone other than Wren.

Mr. W. J. N. Leverton

said he was glad to hear what Mr. Statham said as to Barry being the architect of the Houses of Parliament. It was quite impossible for the plan to have been by Pugin. As to Burgess's design for the Houses of Parliament, South Kensington had at one time all the designs for the work, and some time ago it was decided to destroy them. Before this was done some Office of Works men, thinking this a pity, made a selection of them, and Burgess's design was one of those saved.

The Chairman,

in putting the vote of thanks to the meeting, said, speaking of Mr. Norman Shaw's houses, one of Mr. Shaw's works which always pleased him was the house in Cadogan-square, in which the architect got what was quite a rare thing in a London house—*i.e.*, quite a large entrance hall—practically the whole width of the house—but he kept it very low. Then the design went up about three steps above the hall to the level of the dining-room, which was a very high room with a beam ceiling, making a very fine room indeed. Then on the mezzanine level there was another low room about 8 ft. 6 in. high, and this and the three steps accounted for the high dining-room. On the first floor were the drawing-rooms from front to back of the house. As to Burges's drawing, he had been trying to get hold of it and other work by Burges as specimens of drawing, but it was difficult to find out where the drawings were. As to the paper, he wished Mr. Statham had included a third part—*i.e.*, lighting, which was almost as important as section. As the paper was almost exclusively about planning, perhaps Mr. Statham would give later on a paper on section and lighting. They had not been told much about the bearing of construction on planning, and it was obvious in a good many works that some things were not exactly matters of design; they were what had to be done in order to carry the thing out as a constructive whole. The block plan of Whitehall was very interesting, and it occurred to him that it might be possible to give in any published illustrations accompanying the paper a plan showing what had been carried out and what Mr. Statham had suggested, in order to see how much more land would have been required to give effect to Mr. Statham's proposals; he did not think much more land would have been required. Mr. Statham had shown the extreme urgency of good planning. Experience in recent big competitions had shown that generally the man who produced the most successful plan—the elevation generally went with the plan—was the successful competitor.

The vote of thanks having been heartily agreed to.

Mr. Statham,

in course of his reply, said he quite agreed with the admiration which had been expressed for Mr. Norman Shaw's plans. Many of his house plans were quite remarkable in the degree of fancy in them. As to his remarks about the Pantheon, what he meant was that the greatness of the building did not depend on its detail. It was a great building in spite of the fact that the order was out of proportion to the dome. In regard to St. Paul's, he thought it an excellent example of his position. Mr. Horsley asked who would like St. Paul's if some one other than Wren had done the detail. But did Wren do the detail? He thought that much of the carving, the swags, etc., were done from mere scribblings by Wren, and that the carver was left to carry it out in his own way. He did not like the detail except in the case of the west towers, but St. Paul's was a great building, in spite of the detail. As to his (the speaker's) Whitehall plan, there was an idea that the land up to Craig's-court could be obtained, and he made his plan on that supposition. He thought the plan would have cost a great deal more to carry out than in the case of the work actually executed, for it would have taken more ground, but his point was that for the sake of the effect it would have been worth the expenditure. It would have been done in France.

The President announced that the next meeting will be held on January 23, at 7.30 p.m., and will be combined with the Camera, Sketch, and Debate Club. Paper by Mr. Theodore Fyfe, F.R.I.B.A., entitled "The Atelier *versus* the Builder's Yard," to be followed by a debate.

The meeting then terminated.

ARCHITECTURAL SOCIETIES.

Bristol Society of Architects.

A meeting of this Society, open to members and their friends, including ladies, was held on the 9th inst., the President, Mr. Foster Wood, in the chair.

A lecture was given by a member and former Hon. Secretary of the Society, Mr. F. Bligh Bond, F.R.I.B.A., Diocesan Surveyor of Bath and Wells. The subject treated was that of "Somerset Churches," and a fine collection of about a hundred lantern views was shown.

The lecturer was of opinion that the Perpendicular style and its transition from the geometrical was developed in these churches at a very early date. So much so that Somerset may be regarded as the home of this phase, and it was probably carried thence by ecclesiastics to the Midlands, East Anglia, and other parts of the country. Another beautiful feature of the Somerset churches is that of the characteristic square towers, built as a result of the wonderful perfection in campanology attained during the XVth century. Many interiors were illustrated and described specially with reference to the Celtic and Saxon types of planning as they affect the screening of the chancel and width of its arch. Examples were shown of Jacobean and Carolean screens, which, as at Croscombe, include praiseworthy attempts to replace, in measure, the work destroyed by the decree of Queen Elizabeth, who ordered all rood lofts to be taken down. Even some of the early Hanoverian work may be considered fairly harmless, but anything later than the first George was usually incongruous and debased.—On the motion of Mr. G. C. Lawrence, a very hearty vote of thanks was accorded to Mr. Bond for his lecture.

The Royal Institute of the Architects of Ireland.

An ordinary meeting of the Council of this Institute was held at 31, South Frederick-street, Dublin, on Monday last. The President, Mr. A. E. Murray, R.H.A., F.R.I.B.A., occupied the chair.

The minutes of the ordinary and special meetings of December 5 and 19 were read and signed, and a considerable amount of correspondence was dealt with. The Standing Committees were appointed as follows (the President and Hon. Secretary being *ex officio* members in each case):—Professional Practice Committee—Messrs. W. Kaye Parry, G. C. Ashlin, L. O'Callaghan; Arts Committee—Messrs. Frederick Batchelor, C. J. MacCarthy, G. P. Sheridan; Publication Committee — Messrs. H. Allberry, R. Caulfeild Orpen, J. H. Webb; Examination Committee — Messrs. H. Allberry, R. Caulfeild Orpen, F. G. Hicks.

The question of the revision of the letter of invitation to tender was referred to the Professional Practice Committee. It was decided to hold an examination at an early date for entrance into the Students' Class of the Institute.

GENERAL NEWS.

Professional Announcements.

Owing to Bishopsgate-street Within and Bishopsgate-street Without being amalgamated and to be now known as "Bishopsgate," Mr. A. S. R. Ley's address will in future be No. 214, Bishopsgate, E.C.—We are asked to announce that the offices of the Road Board, on and after January 9, will be at Queen Anne's Chambers, Broadway, Westminster, S.W. Telephone: Victoria 4170.

Property Sales.

In March next will be offered for sale at the Mart the freehold site of Orme-square, Bayswater-road, extending over nearly 73,000 ft. super., and having an open side of 240 ft. towards Kensington Gardens. The rentals of the twelve houses amount to an estimated total value of 2,554*l.*, and the leases will expire on Midsummer Day, 1913.—In May, at the Mart, the freehold block, Trafalgar-buildings, at the corner of Charing Cross and Northumberland-avenue, with frontages of 200 ft., and a ground area of about 8,300 ft. super., which is now let at a ground rent of 4,000*l.* per annum upon a lease expiring at Midsummer of next year. The block was built after designs by F. and H. Francis, illustrated in the *Builder* of April 21, 1883, and Mr. F. W. Waller rearranged the interior for the temporary occupation of the National Liberal Club, founded in 1882.—Rycote Park, 1,400 acres, in Oxfordshire, a seat of the Berties, Earls of Abingdon, and before them of the Quartremaynes. The chapel, now in ruins, of St. Michael and All Angels was founded, 1449, by Richard Quartremayne. Rycote, a prison house of the Princess Elizabeth, *temp.* Mary I., was partially consumed by fire in 1747.

Baker-street Railway Terminus Station.

Mr. W. Willox, Engineer to the Metropolitan Railway, has prepared plans for an extensive enlargement and improvement of the terminus and the junction with the Circle line at Baker-street, in the triangular space between Upper Baker-street, and the two blocks of residential flats, Cornwall-mansions, in Allsop-place. The scheme provides for a building, with general offices, booking hall, waiting rooms, etc., upon a 200-ft. frontage in lieu of the existing premises in Marylebone-road (north side), the lengthening and doubling of the width of the platforms of the east station under new roofs, and a widening of the entrance into the tunnel beneath Park-road by means of a covered way having a width decreasing from 63 ft. to 35 ft. at the remoter end; the roadway above will be carried upon girders interspaced with reinforced concrete.

University College, London, Extension.

An appeal is made by the authorities of the College for a sum of 25,000*l.* to enable them to purchase a site to meet the increasing demands of room for the research laboratories for the Chemical School of the College. The site has a frontage of 320 ft. to the south-east side of Gower-place, and includes Little Gower-place, which abuts against the north-west boundary of the buildings of University College.

The Institute of Metals.

The membership of the Institute is now over 550. On the first day of the annual general meeting, January 17, members will visit, by the courtesy of the Thames Iron

Works, Shipbuilding, & Engineering Company, Ltd., the yard in which H.M.S. *T'hunderer* is being built. The second annual dinner will be held the same evening. The business of the annual general meeting will be conducted at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W., on January 18, commencing at 10.30 a.m. The following papers will be read and discussed:—"A new Critical Point in Copper-Zinc Alloys: Its Interpretation and Influence on Their Properties," by Professor H. C. H. Carpenter, M.A., Ph.D., with an appendix on "The Nature of Solid Solutions," by Mr. C. A. Edwardes, M.Sc.; "Some Practical Experience with Corrosion of Metals," by Engineer Rear-Admiral J. T. Corner, C.B.; "Some Tests on White Anti-Friction Bearing Metals," by H. J. Humphries, Esq., and Professor C. A. Smith, M.Sc.; "The Adhesion of Electro-Deposited Silver, in Relation to the Nature of the German Silver Basis Metal," by Professor A. McWilliam, Assoc.R.S.M., and W. R Barclay, Esq. There will also be presented the "Preliminary Report to the Corrosion Committee," by Mr. G. D. Bengough, M.A. This report will deal with "The Present State of Our Knowledge of the Corrosion of Non-Ferrous Metals and Alloys, with Suggestions for a Research into the Causes of the Corrosion of Brass Condenser Tubes by Sea Water." Mr. G. Shaw Scott, M.Sc., is the Secretary of the Institute, Caxton House, Westminster, S.W.

The Campanile, Venice.

The Campanile is rapidly approaching completion, and the year 1911 should see the finality of its re-erection. The bells are ready for rehanging. All have been recast except the largest, which was the only one to escape destruction when the structure fell. The rising scaffolding, which was described in these pages some time ago, has now been removed, and a further structure has been put together and carried on needles lying across the building at the cornice level, the whole being supported by struts from below. It will have taken nine years to re-erect what stood for a thousand years. May we hope that a future of equal duration lies before it.

University of London: British Museum and Victoria and Albert Museum Centres.

Mr. Banister Fletcher, F.R.I.B.A., delivered a lecture on Monday last week at the Victoria and Albert Museum on "The Evolution of English Architecture," starting from the time of the Druids and the occupation of the Romans, but dwelling more in detail on the Anglo-Saxon and Norman periods. The lecture, which forms part of a course on "Mediæval Architecture" (which, by permission of the Board of Education, is being given in the Museum), was the first of a series of eight lectures on English Gothic. The lecture was illustrated by lantern slides, photographs, and diagrams.—On the following Monday "The Evolution of Plans, Vaulting, and Buttresses" was dealt with. After each lecture the exhibits in the Museum bearing upon the subject which has been dealt with are visited and explained by Mr. Fletcher.—On Tuesday last week a series on "Ancient Architecture" was continued at the British Museum (by permission of the Trustees). This was an opening lecture on "The Roman Style," the first of eight on the subject. Mr. Fletcher explained how Roman architecture was a development of the true or radiating arch of the Etruscans (an example of which we have to this day in the Cloaca Maxima at Rome), and the "Orders" of the Greeks, which, however, they used more decoratively than constructionally, placing them one above the other, and applying them to their concrete walls, allowing these to do the "carrying" work. The use of concrete, the way it was made and applied and faced with brick or other material, the development of the barrel or waggon-headed vault into the cross vault and other constructional methods were explained. After the lecture a copy of an Etruscan rock-cut tomb in the Græco-Roman Basement was visited.—The following Tuesday the lecture was on "The Fora and Rectangular Temples of the Romans," showing how the latter retained certain Etruscan features, such as the high Podium and the omission of the Peristyle of the Greeks. Particulars of the lectures can be obtained from the Hon. Secretary, Miss Claire Gaudet, 120, Cheyne-walk, Chelsea.

New Diary.

"The 'Sanitary Record' Year-Book and Diary for 1911" (Fetter-lane) is the twenty-ninth issue of a neat and well-arranged work, the diary part of which is interleaved with blotting-paper. The diary contains much useful information in regard to sanitary affairs.

The Old Church of St. John, Ayr.

It was reported at Ayr Town Council on the 9th inst. that the Council had had under consideration a proposal to acquire the property known as the Fort Castle and grounds, the site of the old Collegiate Church of St. John, which dates from the early part of the XIIth century. A report has been obtained from Mr. J. K. Hunter, architect, Ayr, who stated, from his experience of excavations carried out twenty years ago, that it would be an easy undertaking, and not a costly one, to permanently uncover the walls and piers which still remain and leave them in such a condition that they would be a centre of archæological and historical interest. A portion of the buildings remaining above ground formed part of the original church, and it would be possible to restore the west rose window, the west doorway, and other features.

Liverpool Town Hall.

The suggested setting back of the Liverpool Town Hall is again to the fore. At the last meeting of the Finance Committee the reports of the Corporation Surveyor and the City Engineer on the matter were further considered, and the Chairman and Deputy Chairman were authorised to interview the Exchange Company.—*Liverpool Courier.*

Willing's Press Guide.

We have received a copy of the thirty-eighth annual issue of this guide from James Willing, jun., Ltd., 125, Strand, W.C. The work is well known as a concise and comprehensive guide to the Press of the United Kingdom, the arrangement and get-up of the contents being admirable. The guide contains lists of the principal colonial and foreign journals and a variety of general information. The price of this excellent little work is 1s.

LEGAL COLUMN.

The Housing Acts.

A case is reported in the *Times* of 6th inst. in which the Sheriff-Substitute in Glasgow set aside a closing order relating to a tenement containing forty-one dwelling houses. The order was held to be invalid on various technical grounds, but we refer to the case on one of these points alone. The Sheriff held this block of tenement houses not to be a "dwelling house" within the meaning of the Acts, and he was led to this conclusion by a curious reason. By sect. 29 of the Housing of the Working Classes Act, 1890, "dwelling house" is defined thus—"dwelling house means any inhabited building, and includes any yard, garden, outhouses, . . ." In the Housing and Town Planning Act, 1909, the definition is amended by omitting the words "means any inhabited building and"; in other words the definition now gives no particular meaning to be attached to the expression "dwelling house," but solely states that it shall include certain things appurtenant to the same. The Sheriff, if the definition had remained unaltered, would have held it to include this tenement, but owing to the alteration he held that the word must be construed in its ordinary meaning, and he defined that meaning to be a "home," a place where a person or family resides, a private house as distinguished from a place of business. We venture to think that this decision is likely to be questioned on many grounds. In the first place the intention, no doubt, of the alteration in the definition was to widen it and not to narrow it, so that houses actually not occupied might not be temporarily excluded, and the expression defined being left at large, we do not agree with the very limited meaning attached to the expression by the Sheriff in the case as reported.

LAW REPORTS.

(Before the OFFICIAL REFEREE, Mr. Muir Mackenzie.)

Architect's Heavy Claim against the Cardiff Corporation.

Seward *v.* The Cardiff Corporation.

THE hearing of this case was resumed this week, it being an action by Mr. Edwin Seward, an architect and surveyor practising at Cardiff, to recover from the defendants 10,000*l.* in connexion with the preparation of plans, etc., for the erection of the Free Library and Welsh Museum at Cardiff and as damages for alleged breach of contract.

The facts of the case and the evidence were fully reported in the *Builder* of December 17 and 24 last.

Mr. E. M. Pollock, K.C., Mr. Rowland Vaughan Williams, Mr. Herbert, and Mr. Wood-Hill (instructed by Messrs. Cousins & Botsford) appeared for the plaintiff; and Mr. B. Francis Williams, K.C., Mr. John Sankey, K.C., and Mr. St. John Francis Williams (instructed by the Town Clerk of Cardiff through Messrs. Smith, Rundell, & Dodds) represented the defendants.

Counsel having summed up on behalf of the defendant Corporation, Mr. Pollock replied for the plaintiff. Having dealt with the evidence which was given in support of the defence, the learned counsel commented strongly on the fact of the Corporation not having called Mr. Wheatley, the Town Clerk, as to certain imputations which had been made during the course of the case. He (counsel) said that the action of the defendants in this matter was unworthy of a Corporation.

At the conclusion of the learned counsel's address, the learned Official Referee said that he would consider his decision.

Judgment was accordingly reserved.

COMPETITION NEWS.

Competition of Plans for Court of Justice, Athens.

H.M. Acting Consul at the Piraeus reports that a competition of plans is invited by the Greek Ministry of the Interior (Public Works) of the erection of a Court of Justice at Athens. The cost of the building must not exceed 4,000,000 drachmæ (160,000*l.*). Competitors must submit plans and estimated cost of the work in detail, and these documents together with a sum of 200 drachmæ (8*l.*), which will be paid as an honorarium to the jury, will be received at the "Section d'Architecture du Service Central des Travaux Publics, Ministère de l'Intérieur," Athens, up to midday on August 8, 1912, next. A first prize of 20,000 drachmæ (800*l.*) and a second prize of 8,000 drachmæ (320*l.*) will be awarded for the best plans selected. The competition is open to foreign architects. The Greek *Official Gazette* containing further particulars (in Greek and in French) may be seen by British architects at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall-street, London, E.C.

Reddish Congregational Schools and Institute.

The designs submitted by Messrs. George Baines & Son, Clement's-inn, Strand, London, W.C., have been adopted for these buildings, the estimated cost being 2,600*l.*

York-road Schools, Battersea.

In the recent competition held for these schools the designs submitted by Messrs. George Baines & Son, Clement's Inn, Strand, London, W.C., have been placed first, and the work is to be proceeded with at once.

PAVILION, PENZANCE.

Penzance Town Council met in committee on the 5th inst. and discussed the plan for the proposed pavilion and winter garden in the Alexandra Grounds on the Promenade. The Council approved of the principle of the plan and the scheme, and recommended its acceptance by the Council at its next meeting. The scheme is estimated to cost 5,000*l.* The architects are Messrs. Cowell & Cowell, of Newquay.

CORRESPONDENCE.

Licentiates, R.I.B.A.

SIR,—In your issue of December 17 you published a letter in which I drew attention to certain remarks made at the meeting held at Sheffield on December 9, and at which Messrs. Hubbard and Cross explained the Licentiate scheme. I also asked some questions arising out of these remarks, and I expected—naturally enough, I think—that Messrs. Hubbard and Cross would be eager to give the desired information, which they could, with extremely little trouble, have put before your many readers, seeing that they travelled 1,200 miles to explain the scheme to comparatively small audiences. Up to the present, however, no attempt has been made to clear up the points raised.

Now, I believe, though I may be considered optimistic in this, that, while there may be members of the Institute who merely wish to increase the number of Licentiates and are not greatly concerned with the means adopted, there are, on the other hand, many members who are particularly anxious that every possible care shall be taken with these elections, and that the forms of nomination, etc., shall be taken in all seriousness.

I therefore again ask Messrs. Hubbard and Cross to answer my questions, and also to state what action they advise members to take with regard to applications for Licentiateship published in the Supplement of the R.I.B.A. *Journal* in those cases in which it is presumable that the nomination forms have been signed by members whose personal knowledge of the candidates is inadequate.

Your correspondent "H. D." says I seem "to quarrel with the principle of admitting the Licentiates without their having been through the usual examination for the Associateship."

I can only say in answer that, though I may have seemed to do this, I really did not do so.

"H. D." also asks, "How many of the Fellows and Associates have been admitted on the same credentials as are required of the Licentiates?"

I do not know the correct answer, but I hope it is "Very few."

I am quite ready to admit—though I do not see what useful purpose it will serve—that, of the man of twenty or thirty years' experience and the fledgling referred to by "H. D.," the former is likely to be the "more qualified architect." I hope "H. D." will also agree with me that, on the other hand, while the fledgling may be a perfectly harmless person, the man of twenty or thirty years' experience may have spoilt a town.

Of course, just as a man who has not been weighed may be either heavier or lighter than one who has, so a man who has not taken an examination may know either more or less than the man who has; but one knows the weight of the weighed person, and at least something about the attainments of the examinee.

I hope "H. D." does not think I am in favour of "cramming" for examinations, for, on the contrary, I trust that the R.I.B.A. will make such good use of the powers conferred on them by the Supplemental Charter that after 1913 "cramming" for their examinations will practically be at an end.

Neither do I think the R.I.B.A. examinations are all that they ought to be.

"But that is another story."

W. S. PURCHON.

Llandrindod Pavilion Competition.

SIR,—I see by an advertisement in the professional papers that the Urban District Council are again advertising for competition designs for a pavilion. This is for the third time, and I take the opportunity, as a victim in the two previous competitions, of warning architects to beware.

The first advertisement appeared in October, 1901, and the second in November, 1907.

In the first a local architect (working jointly with the surveyor) was honoured (?) with selection, and after a great deal of wasted energy and expense in the preparation of many drawings, the scheme was abandoned, and, I believe, without even a penny ever being paid for their trouble.

Five years later another advertisement appeared, asking for designs, a copy of the instructions being sent to me, although I made no application for them; but as I competed before it was supposed I might be willing to do so again, which I unfortunately was. Thinking matters may have arranged themselves fairly, I joined with the local architect who was successful in the first competition, and we acted jointly in preparing a design which was actually selected at a meeting of the Urban District Council by a large majority "for further consideration." One of the clauses in the instruction to competitors stipulated "that all designs were to be delivered *free of cost unsigned*, but each set to be accompanied by a sealed envelope bearing outside the *nom de plume* corresponding with the one on the drawings." To all architects accustomed to competition work this implied that secrecy was to be maintained till a selection had been finally made, and, in fact, was a virtual contract to that effect. But what happened was that as soon as our design was "selected for further consideration" it seemed to occur to the Council that they must be careful not to make any mistake, so they decided to have the envelope opened before "further consideration" put the business in the wrong hands. This was, I consider, a breach of the implied contract; and although I protested against it at a later date, they were advised that another clause of the instructions protected them from liability.

The result of the second competition was that the scheme was knocked on the head. Nine designs were returned to their authors, after being held at the Clerk's office for about nine months, and were so much waste paper, though each must have cost at least 25*l.* to prepare. But before they were returned the Urban District Council proposed to have a scheme carried out by their local surveyor, who was to prepare drawings. Now, after a considerable lapse of time, apparently even this has fallen through, and the architectural profession is being invited to submit a further collection of designs for the amusement of this most enlightened Council. Surely twelve sets of drawings, costing at least 300*l.*, ought to be the limit of what they can expect to get without paying a penny for all the information they might have gained, and I hope all members of the architectural profession will think so, too.

JOHN HENRY WILLIAMS,
15, *Foregate-street, Worcester.*

INTERCOMMUNICATION COLUMN.

Drain or Sewer.

SIR,—In a small country town there are two houses approached by a carriage drive about 150 ft. in length from the main street. This drive was made some generations ago at the expense of the various parties who had rights to use it in certain proportions.

Up to about twenty-five years ago the houses were provided with the old-fashioned vault closets then common on the country, but there was an old stone drain from the premises to carry off waste water. Then modern sanitary fittings were provided and a proper drain laid in place of the old stone one connecting with the sewer in the main street, and this has been the position up to a year ago.

Last year the owners of the property, at the entrance to the drive, who have the use of it part of the way to reach the back entrances to their premises, fitted up an outbuilding backing on to the drive as a w.c., making the window required for lighting same in the wall forming the boundary of the carriage drive, and also carrying the overflow pipe of the flushing tank through this wall to discharge over the drive. A connexion was made with the drain, which had been laid by the owners of the two better-class houses higher up at their sole expense, without their leave being asked or any communication being made to them beforehand.

Complaint was made as soon as this action was heard of, and attention called to the state of the carriage drive. The boundary wall on one side of the property at the entrance to the drive is out of the perpendicular in several places, having been forced over by trees, and the flagstone path under this wall, about 2 ft. in width, which is the only clean way for the occupiers of the important property at the top of the drive to reach the main street, is so uneven from the same cause that a feat of balancing is required in passing along it.

The attention of the owners of the property at the lower end has been called to the matter by the owner of the property at the top end, but so far his communications have been disregarded, which causes him much annoyance and may lead to financial loss.

He wants to know whether the other owners of property having the use of the drive had right in opening a w.c. window and flushing tank discharge pipe on to it, and also connecting their new drain with the one previously laid by his forebears. It has been suggested that the drain is a "sewer," but there are many cases in towns of two or more houses being connected with the main sewer through one drain, but that would not give all the parties owning property round to make a connexion with it. Further, if the drain is a "sewer," the owners who laid it in the first place at their own expense to drain their own property would not have done so had it been expected that the other parties would wish to take advantage of it; in any case, they ought, having the advantage, to pay something to the other in view of the expense which has been saved them. The openings have been detrimental to the more important property, as will be understood.

He also wants to know whether the Surveyor to the Town Council can compel the owners of private approaches to keep them in good repair.

ACUTANNOY.

Chimneys.

SIR,—The following appears in a recent issue of the *Scientific American* on the subject of improper use of coal and faultily constructed chimneys, and it may be of use to "Ignorant," who inquired as to smoky chimneys in your issue for December 24, p. 784:—

"Unnecessarily tall and cold chimneys cause a good deal of waste. These must be heated up before there can be a good draught. Under-sized chimneys are likewise bad, for they cannot accommodate sufficient volume of gases. A chimney must run higher than the tallest part of the house to work well. Outside chimneys are always wasteful coal consumers, because the outside walls are constantly cooling off and retarding combustion. The ideal chimney for drawing is placed in the middle of the house, where it will escape sudden atmospheric changes, and also radiate heat from the bricks into the rooms. Then chimneys are poor heat conductors and dangerous at the same time. Each fireplace, stove, and furnace should have a separate flue to itself, and this should have as few crooks and angles as possible. The greater the draught the faster the fuel must be consumed, and the greater must be the percentage of heat units lost through the chimneys. It costs ten times as much in fuel to start a fresh fire as to keep a good one going steadily. It takes nearly as much to stir up a half-dead fire to the heating point. Good firing means that the chimney and flues should not be allowed to get cold. If so, they must be heated up before they can draw well, and this means a great waste of coal."

SMITH & WELLSTOOD, LTD.

SANITATION AT THE ROYAL COURTS OF JUSTICE.

During the last six weeks the North British Plumbing Company have been carrying out a scheme under the H.M. Office of Works for the redrainage and sanitation of the east wing of the Law Courts. The existing sanitary arrangements have been abolished, and new lavatory accommodation has been installed on each floor. Considerable difficulty was experienced in carrying out the work during the sitting of the courts, as operation in many cases had to be stopped while cases were being heard.

SANITARY INSPECTORS' ASSOCIATION.

A meeting of the Sanitary Inspectors' Association was held in Carpenters' Hall, London-wall, on Saturday last week, when Mr. Sidney Sharpe read a paper on the Amalgaline system of plumbing. The lecturer claimed that, with one exception, this system complied with all the by-laws in force, that the work when finished had a better appearance than that now in vogue, and could be executed at a considerable reduction in cost. At the conclusion of the paper the pipes joined by this method were subjected to hydraulic and torsion tests, which proved that the joint was distinctly stronger than the other portion of the pipe. A selection of joints and plumbers' work was on exhibition. A discussion followed, during which the general trend of opinion expressed was distinctly favourable to this new system.

EDITORIAL SUMMARY.

The leading article this week (p. 33) deals with competition methods, giving hints as to shortening preliminary labour

The Royal Academy Winter Exhibition, now being held at Burlington House, is noticed in our second article (p. 34). The exhibition includes the work of five deceased British artists.

Our "Notes" this week (p. 35) deal with "Practical Structural Mechanics"; "Paris Fire Brigade"; "Royal Academy Schools"; "Limited Competitions."

A notice of the Sketch Society Exhibition will be found on p. 36.

At the fortnightly meeting of the Architectural Association Mr. H. H. Statham read a paper on "Architecture as Plan and Section." The lecture, which was illustrated by lantern slides, dealt at considerable length with planning—its great importance in architectural design (p. 36).

Our Monthly Review of Construction (p. 45) includes articles on Definitions Used in Structural Mechanics, by Mr. Percy J. Waldram, F.S.I. (with diagrams); Concrete Stanchion Base (with diagrams); Exhibition Buildings, Hollow Bricks, and various notes, etc.

Our Building Trade Section includes articles on "Helpmeets," the London Building Act, Specialists, the late Sir John Aird (with portrait) and communications on the Wood Trade, etc.

At the Surveyors' Institution meeting on Monday, Mr. E. H. Blake read a paper on Highway Law as Affecting Property Owners. The author dealt with the making-up of private streets, liability of repair, extraordinary traffic, and other matters (p. 55 for extracts from the paper).

Part of a paper on the Town Planning Act, 1909, read before the Nottingham Architectural Society by Mr. E. R. Sutton, F.R.I.B.A., appears on p. 56. The paper is mainly a résumé of the Act.

In our Correspondence Column is a letter from Mr. W. S. Purchon on "Licentiates, R.I.B.A.," and another on "Llandrindod Pavilion Competition," by Mr. J. H. Williams (p. 43).

In the Intercommunication Column some facts are given relating to chimneys (p. 43). An article on smoky chimneys, in our issue for August 13, 1910 (p. 176), may be referred to in this connexion.

MEETINGS.

FRIDAY, JANUARY 13.

The London County Council Westminster Technical Institute (Vincent-square, S.W.).—Mr. J. S. Dow, A.C.G.I., B.Sc., on "Illumination"—I. 7.30 p.m.

MONDAY, JANUARY 16.

Royal Institute of British Architects.—(1) Mr. Halsey Ricardo on "Cardinal Medici's Pleasure House." With lantern illustrations. (2) Award of Prizes and Studentships. 8 p.m.

University of London (Victoria and Albert Museum).—Mr. Banister Fletcher on "English Mediæval Doorways, Windows, and Roofs." 5 p.m.

Royal Academy.—Sir William Richmond, K.C.B., R.A., on "Painting: Some Great Idealists"—III. 4 p.m.

Liverpool Architectural Society.—Mr. L. P. Abercrombie on "The Street Architecture of Paris and Vienna." Lantern slides. 6 p.m.

Illuminating Engineering Society (Royal Society of Arts, John-street, Adelphi).—A discussion on "Library Lighting" will be opened by Mr. J. Duff Brown (Islington Public Libraries) and Mr. S. L. Jast (Croydon Public Libraries). Chair will be taken by the President, Professor S. P. Thompson, D.Sc., F.R.S. 8 p.m.

Junior Institution of Engineers (Caxton Hall, Westminster).—Fifth lecture on "The Law Relating to Engineering," by Mr. L. W. J. Costello. 7.30 p.m.

TUESDAY, JANUARY 17.

University of London (British Museum).—Mr. Banister Fletcher on "Roman Circular Temples and Basilicas." Lantern illustrations. 4.30 p.m.

Nottingham Architectural Society.—Exhibition of Designs for a Small Detached House in a Garden City, and criticism by Mr. E. H. Heazell. 8 p.m.

Institution of Civil Engineers.—Papers to be discussed:—"The Strengthening of the Roof of New-street Station, Birmingham," and "The Reconstruction and Widening of Arpley Bridge, Warrington," by Mr. William Dawson. 8 p.m.

WEDNESDAY, JANUARY 18.

Builders' Foremen and Clerks' of Works' Institution.—Annual meeting of the members. 8 p.m.

THURSDAY, JANUARY 19.

Royal Academy.—Sir William Richmond, K.C.B., R.A., on "Painting: The Art of the Future"—IV. 4 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, JANUARY 20.

London County Council Westminster Technical Institute (Vincent-square, S.W.).—Mr. W. T. Creswell, F.S.I., on "The Taxation of Land Values"—I. 7 p.m.

London County Council Westminster Technical Institute (Vincent-square, S.W.).—Mr. J. S. Dow, A.C.G.I., B.Sc., on "Illumination"—II. 7.30 p.m.

Birmingham Architectural Association.—Paper by Mr. Halsey Ricardo.

Glasgow Technical College Architectural Craftsmen's Society.—Mr. D. S. Kinner on "Geometry in Building Work." 8 p.m.

Institution of Mechanical Engineers.—Mr. Walter Dixon and Mr. George H. Baxter on "Modern Electrical Dock-Equipment, with Special Reference to Electrically-Operated Coal-Hoists." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. G. F. Walton on "The Design and Construction of Reinforced-concrete Arches." 8 p.m.

SATURDAY, JANUARY 21.

Architectural Association.—First spring visit, to the extension to the Law Courts, Strand, by permission of Sir Henry Tanner. 1.30 p.m.

Junior Institution of Engineers.—Visit to the Royal Arsenal, Woolwich. 10 a.m.

Association of Teachers in Technical Institutions (Building Section, at Northern Polytechnic).—Mr. Francis R. Taylor on "The Teaching of Architecture in Technical Institutions." 3 p.m.

FIFTY YEARS AGO.

From the *Builder* of January 12, 1861.

Architectural Examination.

ON Monday next the Royal Institute of British Architects will meet to consider further this question. They have already resolved that it is desirable to afford the means for an architectural examination; and on Monday they will probably settle whether the examination shall be open to all members of the profession or be confined in the first instance to the "present Associates and future Fellows and Associates of the Institute." Very good reasons might be given for adopting the latter course in the first instance, but we are disposed to hope that the Institute will at once throw open the opportunity of examination to all, under some necessary conditions. Our readers do not require to be told that we have no desire to see the practice of architecture closed to all but those holding the diploma of certain individuals. But we *have* a desire to see a proper course of study marked out for those who propose to devote themselves to the profession, and made necessary by the force of public opinion. We view the steps proposed to be taken by the Institute as having this for its chief object—as an educational measure mainly; and, as such, it has our warm support.

*** The R.I.B.A. could hardly now be described as "certain individuals."—ED.

ILLUSTRATIONS.

Design for Memorial to King Edward VII., Bristol.

THE citizens of Bristol are fortunate in having secured an exceptionally suitable site for their memorial to King Edward VII. Situated at the top of a hill rising from the heart of the city, and having a building of dignified design as a background, a memorial so placed has every advantage possible to one on a comparatively modest scale. Queen's-road, of which this monument will be the terminal feature, forms the continuation of Park-street, at the bottom of which lies College-green with the statue of Queen Victoria; so that there is a special suitability in the site selected quite apart from its architectural merits. The Victoria Rooms being private property, it is desirable that the approaches should not be interfered with, and the existing carriage-drive with its terrace walls and balustrades will be retained, while the broad flight of steps in front of the portico is but slightly altered; in front of this, however, the whole site will be remodelled, the existing triangular enclosure being thrown open within the lines of the curved balustrades terminated by two venetian masts, designed to contrast with the sweeping horizontal lines of the design.

In the centre of the space so formed will be placed the memorial statue, and in front of it, at a slightly lower level, a decorative fountain, which, grouping with the statue and its base, is intended to obviate the somewhat isolated effect that they might otherwise create.

The perspective, in order to explain the scheme, has been taken from a higher point of sight than would be actually possible, and consequently rather accentuates the curves of the balustrades and steps; in reality these would appear so slight as not to be out of harmony with the severely straight lines of the Victoria Rooms.

The authors of the design are Messrs. Lanchester & Rickards, and the sketch we publish is from the hand of the latter member of this firm.

Designs for "Bathers": Royal Academy Schools.

WE have already given an illustration of Mr. Ralph Longstaff's prize design in the Royal Academy Schools competition for the Decoration of a Public Building. In a year when more than average talent was noticeable there were several outstanding designs as well as the one which was awarded the prize, and we are able to illustrate three of the most remarkable. It will be seen that Miss Clausen has imagined a most pleasing and refined group, with sufficient indications of landscape in the background to give shelter to the bathers. The graceful figures and carefully disposed draperies lend distinction to the design, and the colour scheme is restful and harmonious. Miss Hosking's object seems to have been to make a harmony of colour in unbroken, creamy flesh tones against a cool grey-green background, and decorative effect of a high order is an unmistakable attribute of her scheme. Mr. de Poix's treatment is impressionistic and obviously should be considered at a distance. It has much character and a large scale version would probably be very successful. It is essentially a sketch to determine composition and colour factors, and the painter's ideas have been worked out with due regard to proportion and decorative quality.

OBITUARY.

Mr. Roper.

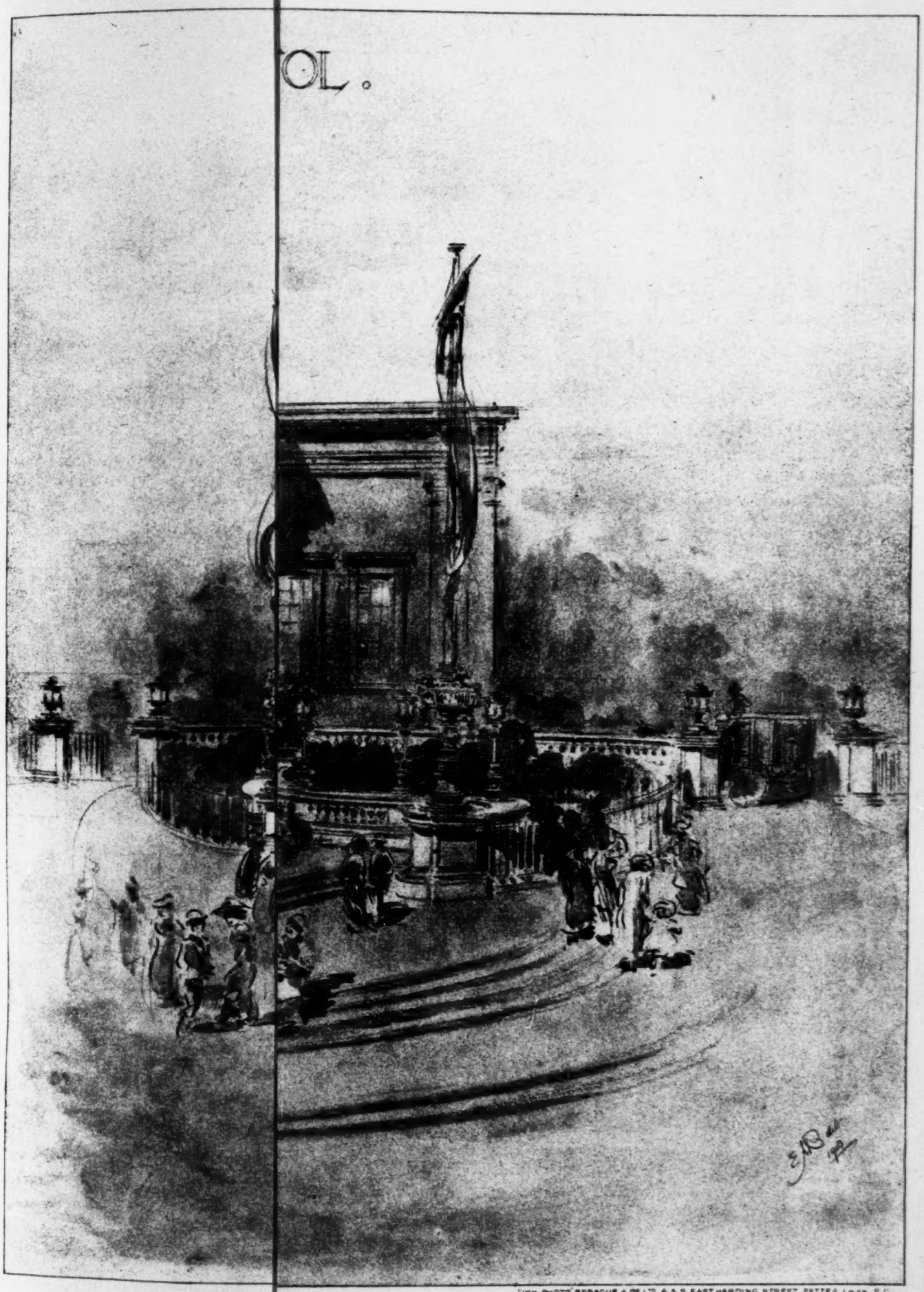
The late Mr. Frederick William Roper, who was elected an Associate of the Royal Institute of British Architects in 1863, practised until recently at No. 9, Adam-street, Adelphi. He was the architect of the schools at Ashford for the Managers of the West London School District, 1903, and his designs were selected by the Kingston-on-Thames Education Committee after competition for their public elementary schools erected in Bonner Hill-road and Oil Mill-lane for 1,144 children by Messrs. Burges & Sons, of Wimbledon, at a cost of about 21,000*l.*, in 1904-6, and, out of ten sets submitted, for the schools built in Richmond-road for 1,062 children by Mr. F. G. Lawrence, at a contract of 10,257*l.*, in 1906-7.

Professor Josef Uphues.

The death at Berlin is announced of Professor Josef Uphues, the sculptor of the statue of Frederick the Great, and designer of the monument to Moltke, before the Reichstag, in that city.

MUNICIPAL WORKS, BURNHAM.

The Local Government Board has notified the Burnham Urban Council that they were empowered to borrow the sum of 6,836*l.*, the estimated cost of the new pavilion, sea-front extension, and other works. The plans approved are those of Mr. W. H. Chowins, Surveyor to the Burnham Urban Council, and Mr. W. T. Douglass, of Westminster, has been the consulting engineer. The total outlay will probably be a little less than 7,400*l.* The main contract has been entrusted to Mr. G. Morgan, of Pontypridd; the pavilion will be built by Messrs. Walter Macfarlane & Co. of Glasgow, at the cost of 1,350*l.*; while the local tender of Mr. W. J. Pople, for work amounting to over 1,000*l.*, has been accepted.



'INK-PHOTO' SPRAGUE & Co. Ltd. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

& Rickards, FF.R.I.B.A., Architects.

In the centre of the space so formed will be placed the memorial statue, and in front of it, at a slightly lower level, a decorative fountain, which, grouping with the statue and its base, is intended to obviate the somewhat isolated effect that they might otherwise create.

The perspective, in order to explain the scheme, has been taken from a higher point of sight than would be actually possible, and consequently rather accentuates the curves of the balustrades and steps; in reality these would appear so slight as not to be out of harmony with the severely straight lines of the Victoria Rooms.

The authors of the design are Messrs. Lanchester & Rickards, and the sketch we publish is from the hand of the latter member of this firm.

Designs for "Bathers": Royal Academy Schools.

WE have already given an illustration of Mr. Ralph Longstaff's prize design in the Royal Academy Schools competition for the Decoration of a Public Building. In a year when more than average talent was noticeable there were several outstanding designs as well as the one which was awarded the prize, and we are able to illustrate three of the most remarkable. It will be seen that Miss Clausen has imagined a most pleasing and refined group, with sufficient indications of landscape in the background to give shelter to the bathers. The graceful figures and carefully disposed draperies lend distinction to the design, and the colour scheme is restful and harmonious. Miss Hosking's object seems to have been to make a harmony of colour in unbroken, creamy flesh tones against a cool grey-green background, and decorative effect of a high order is an unmistakable attribute of her scheme. Mr. de Poix's treatment is im pressionistic and obviously should be considered at a distance. It has much character and a large scale version would probably be very successful. It is essentially a sketch to determine composition and colour factors, and the painter's ideas have been worked out with due regard to proportion and decorative quality.

OBITUARY.

Mr. Roper.

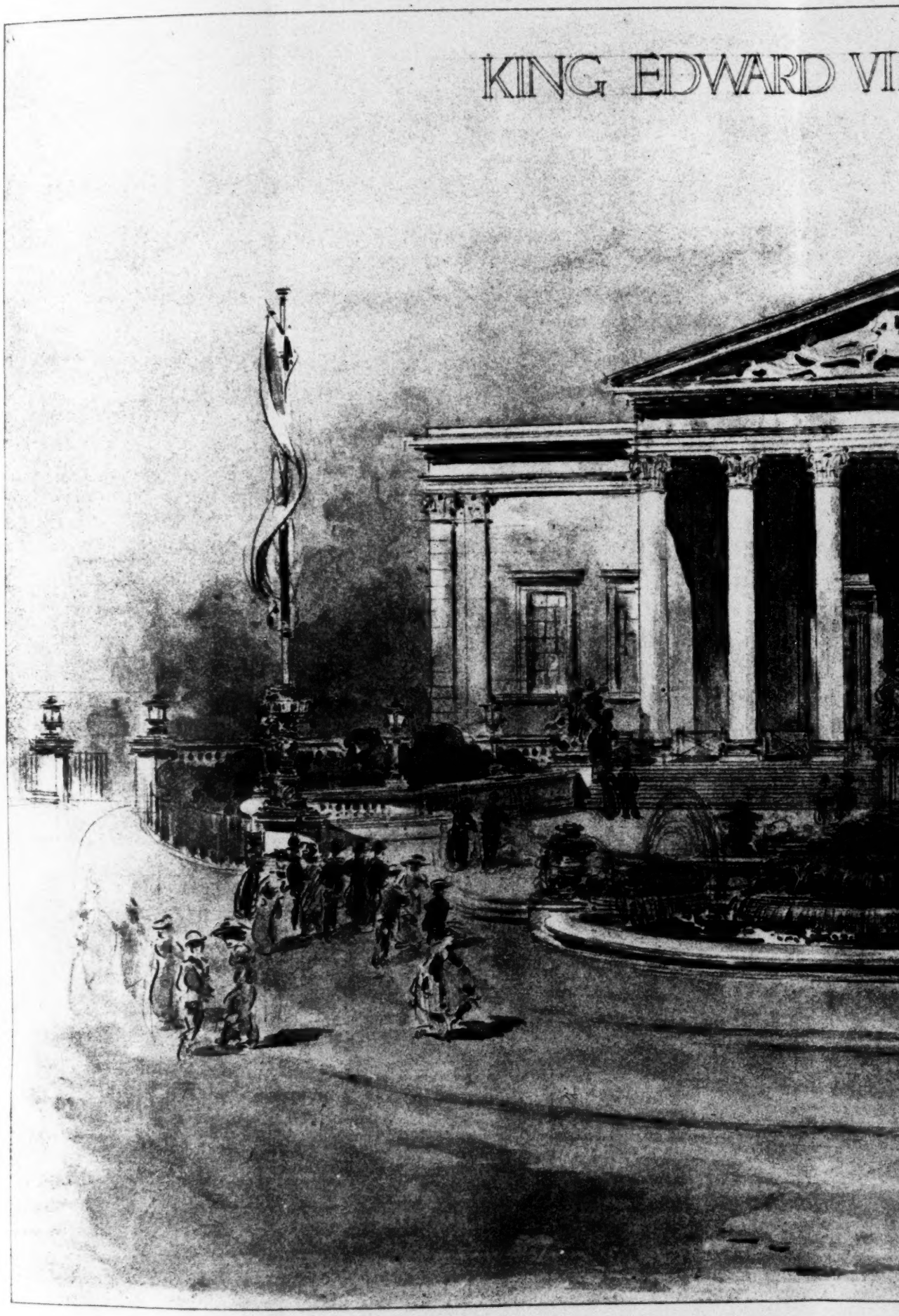
The late Mr. Frederick William Roper, who was elected an Associate of the Royal Institute of British Architects in 1863, practised until recently at No. 9, Adam-street, Adelphi. He was the architect of the schools at Ashford for the Managers of the West London School District, 1903, and his designs were selected by the Kingston-on-Thames Education Committee after competition for their public elementary schools erected in Bonner Hill-road and Oil Mill-lane for 1,144 children by Messrs. Burges & Sons, of Wimbledon, at a cost of about 21,000*l.*, in 1904-6, and, out of ten sets submitted, for the schools built in Richmond-road for 1,062 children by Mr. F. G. Lawrence, at a contract of 10,237*l.*, in 1906-7.

Professor Josef Uphues.

The death at Berlin is announced of Professor Josef Uphues, the sculptor of the statue of Frederick the Great, and designer of the monument to Moltke, before the Reichstag, in that city.

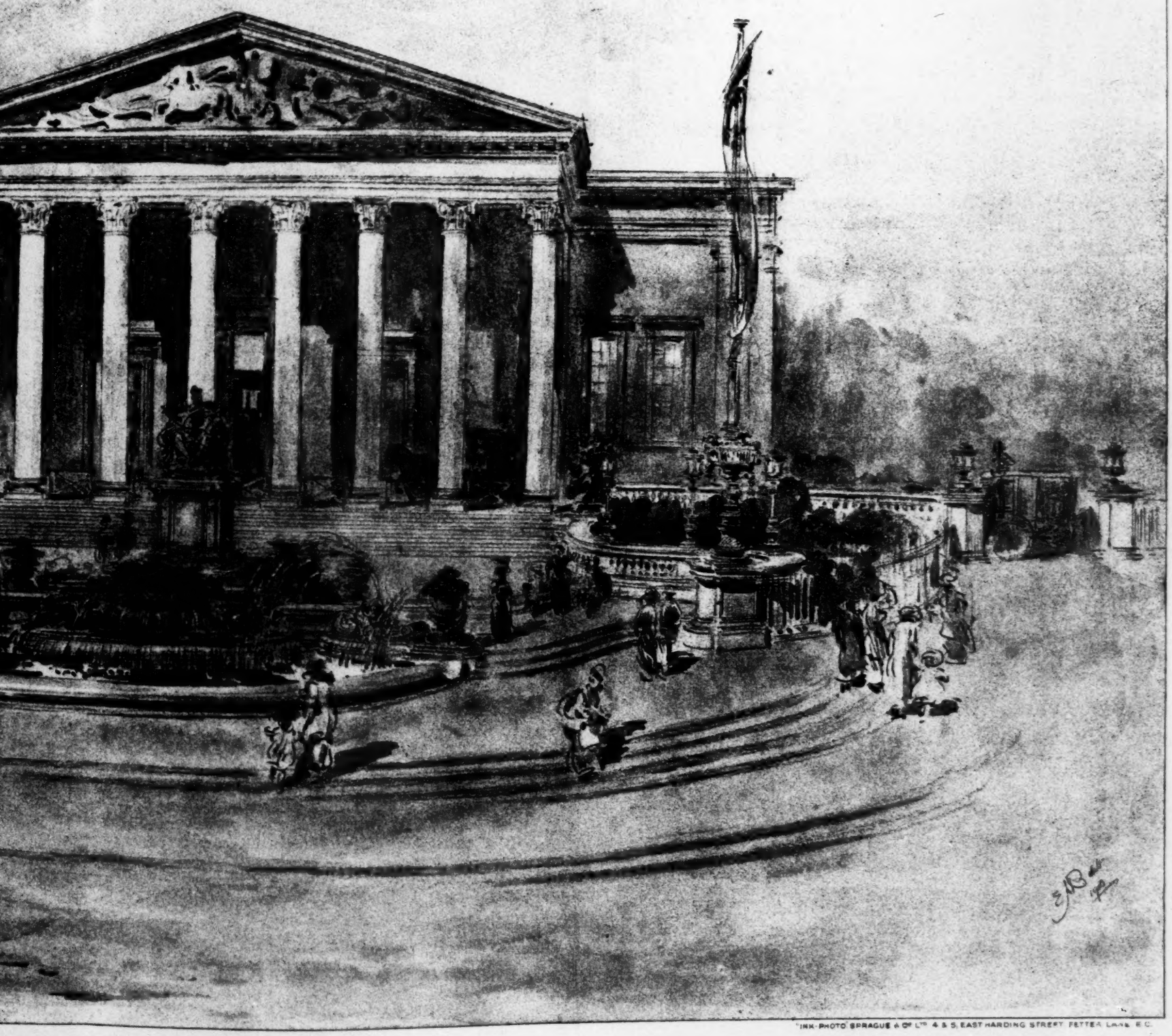
MUNICIPAL WORKS, BURNHAM.

The Local Government Board has notified the Burnham Urban Council that they were empowered to borrow the sum of 6,836*l.*, the estimated cost of the new pavilion, sea-front extension, and other works. The plans approved are those of Mr. W. H. Chowins, Surveyor to the Burnham Urban Council, and Mr. W. T. Douglass, of Westminster, has been the consulting engineer. The total outlay will probably be a little less than 7,400*l.* The main contract has been entrusted to Mr. G. Morgan, of Pontypridd; the pavilion will be built by Messrs. Walter Macfarlane & Co. of Glasgow, at the cost of 1,350*l.*; while the local tender of Mr. W. J. Pople, for work amounting to over 1,000*l.*, has been accepted.



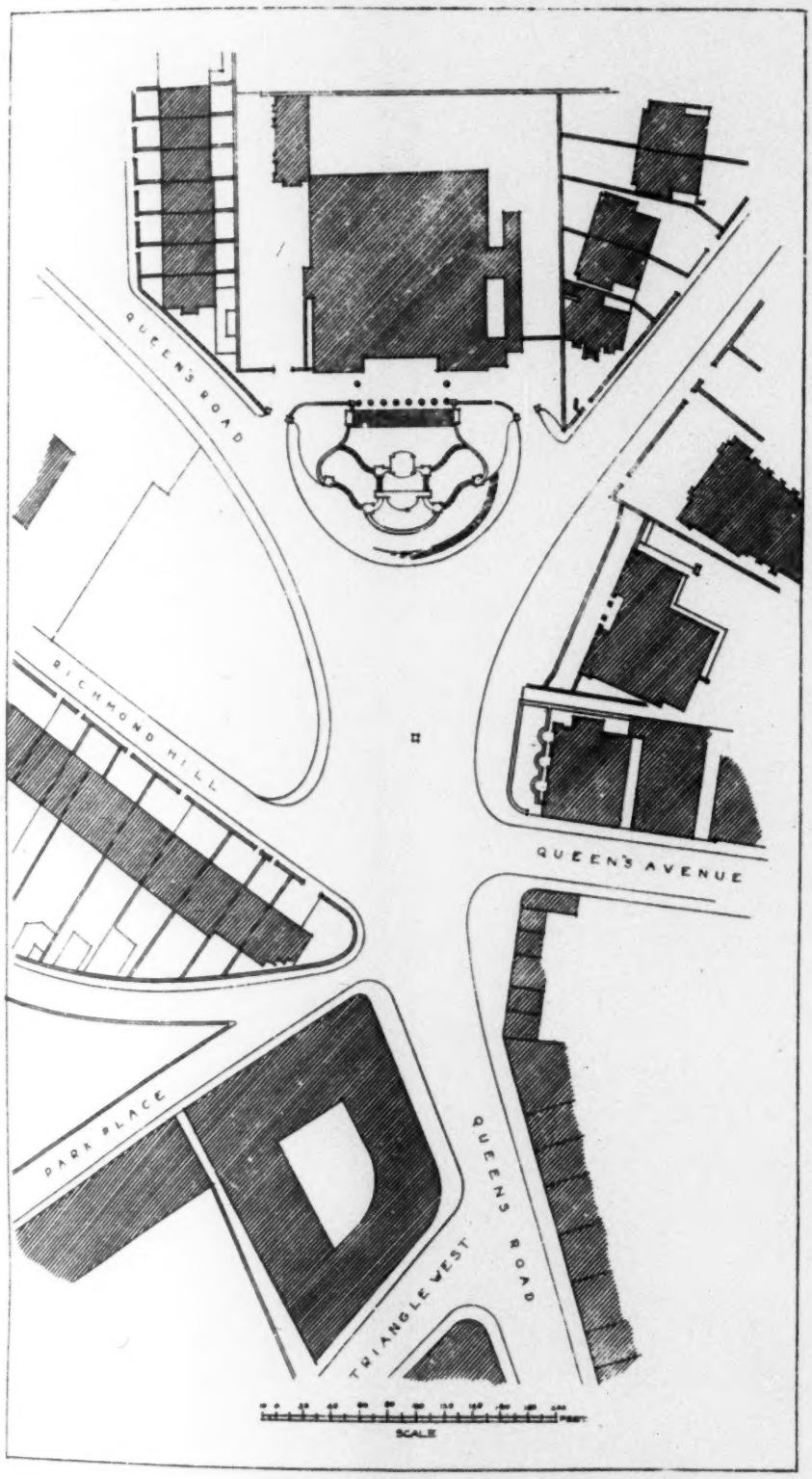
DESIGN FOR KING EDWARD VII MEMORIAL IN FRONT OF T

WARD VII MEMORIAL, BRISTOL.

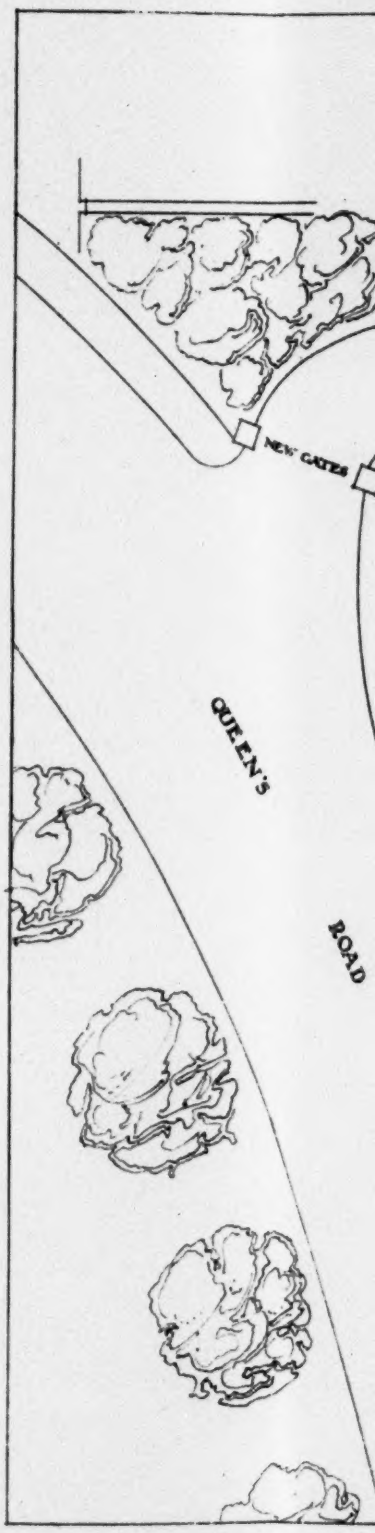


INK-PHOTO SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET FETTER LANE E.C.

AL IN FRONT OF THE VICTORIA ROOMS, BRISTOL.—Messrs. Lanchester & Rickards, FF.R.I.B.A., Architects.



PLAN OF SITE.



DESIGN FOR KING EDWARD VII MEMORIAL IN FRONT OF T

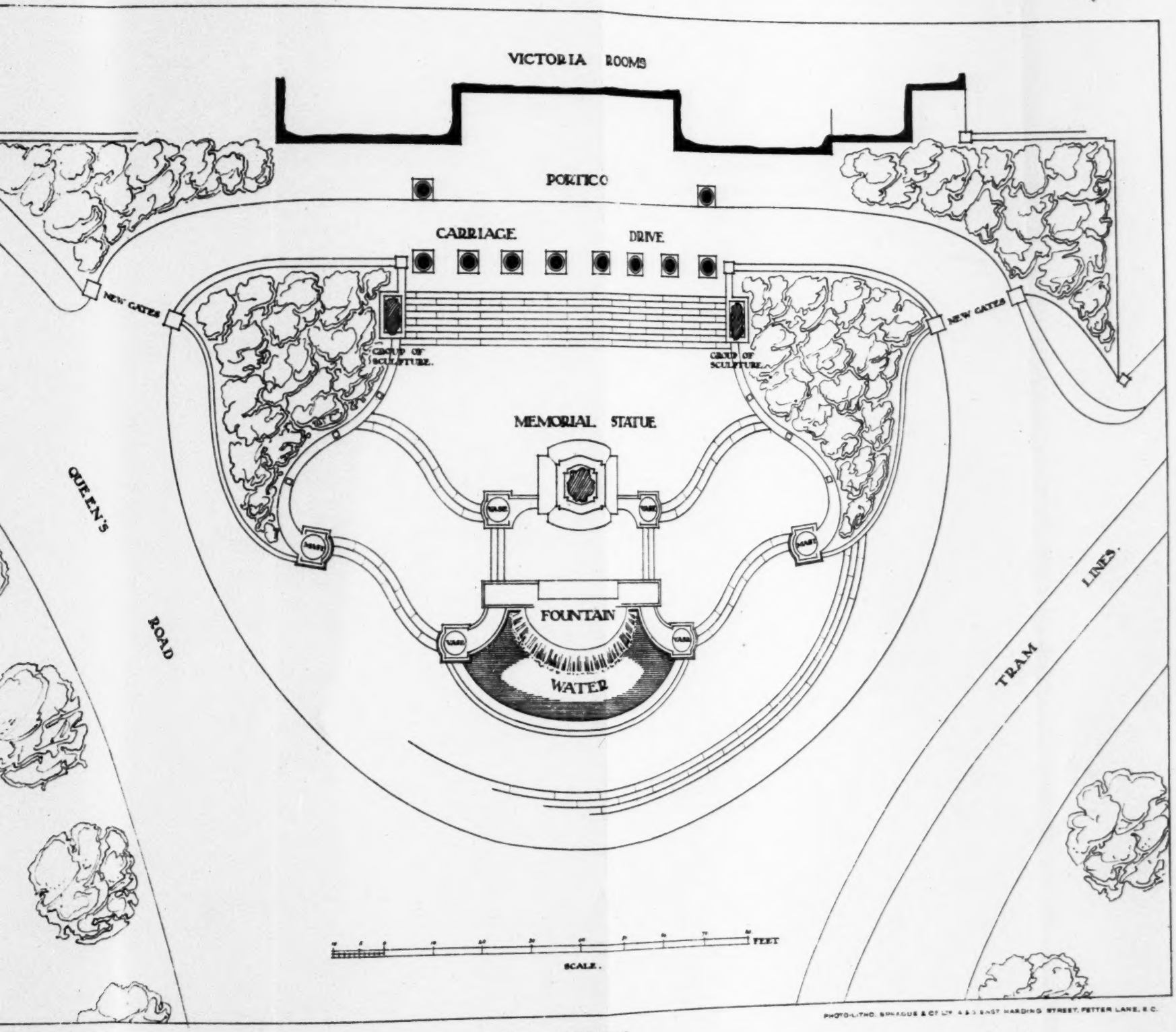


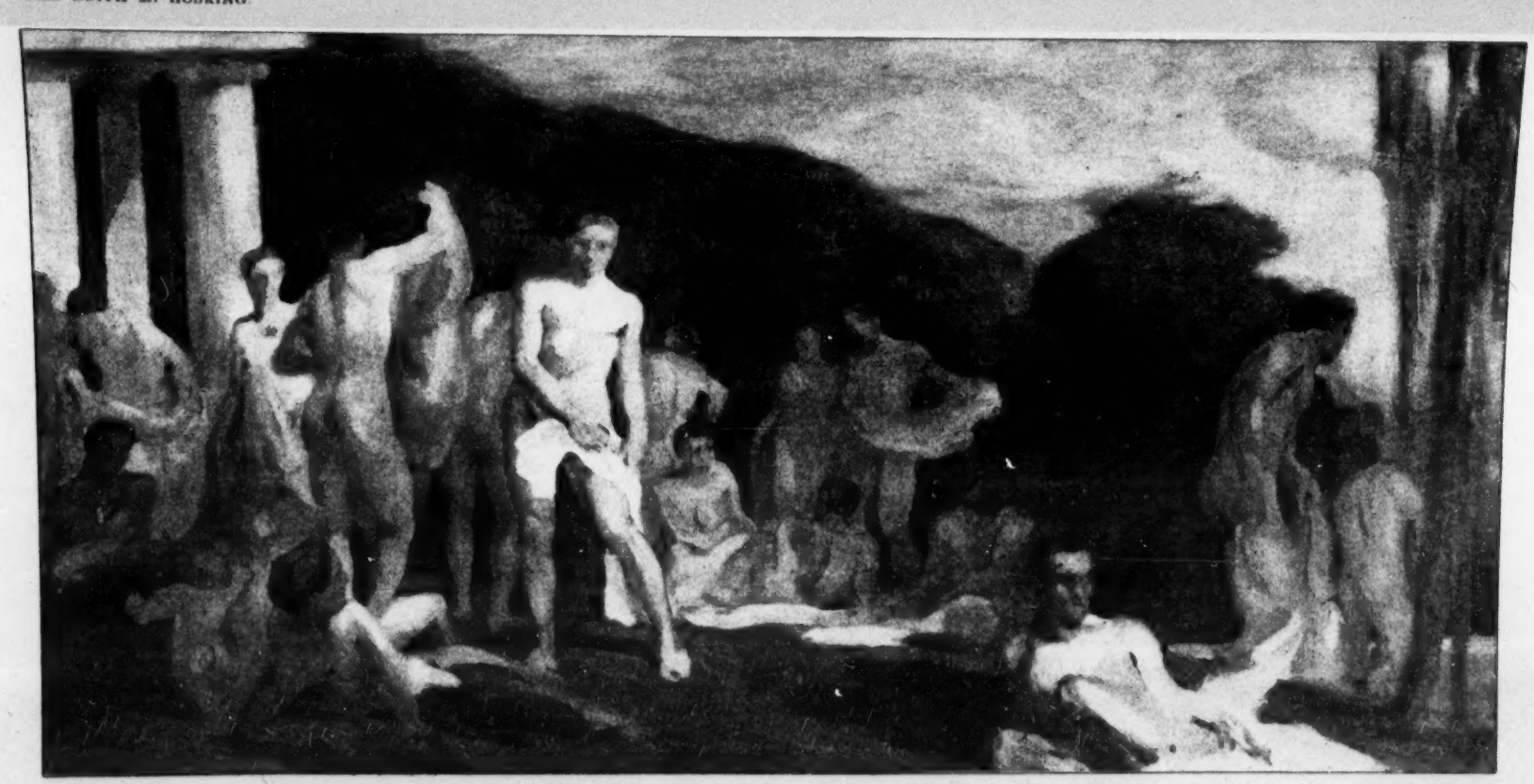
PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

PLAN OF MEMORIAL.

ORIAL IN FRONT OF THE VICTORIA ROOMS, BRISTOL.—MESSRS. LANCHESTER & RICKARDS, FF.R.I.B.A., ARCHITECTS.

MISS KATHARINE P. A. CLAUSEN.

MISS EDITH M. HOSKING.



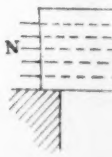
MR. HUGH DE POIX.

R.A. SCHOOLS. "BATHERS": DESIGNS SUBMITTED IN COMPETITION FOR THE DECORATION OF A PUBLIC BUILDING

MO

NC

IN all girde
load the
section
more severely
or neutral a
seen if a num
through hole
model wooden
the protrudi
length. If su
load, as in
the wires are
and extende
but the wi

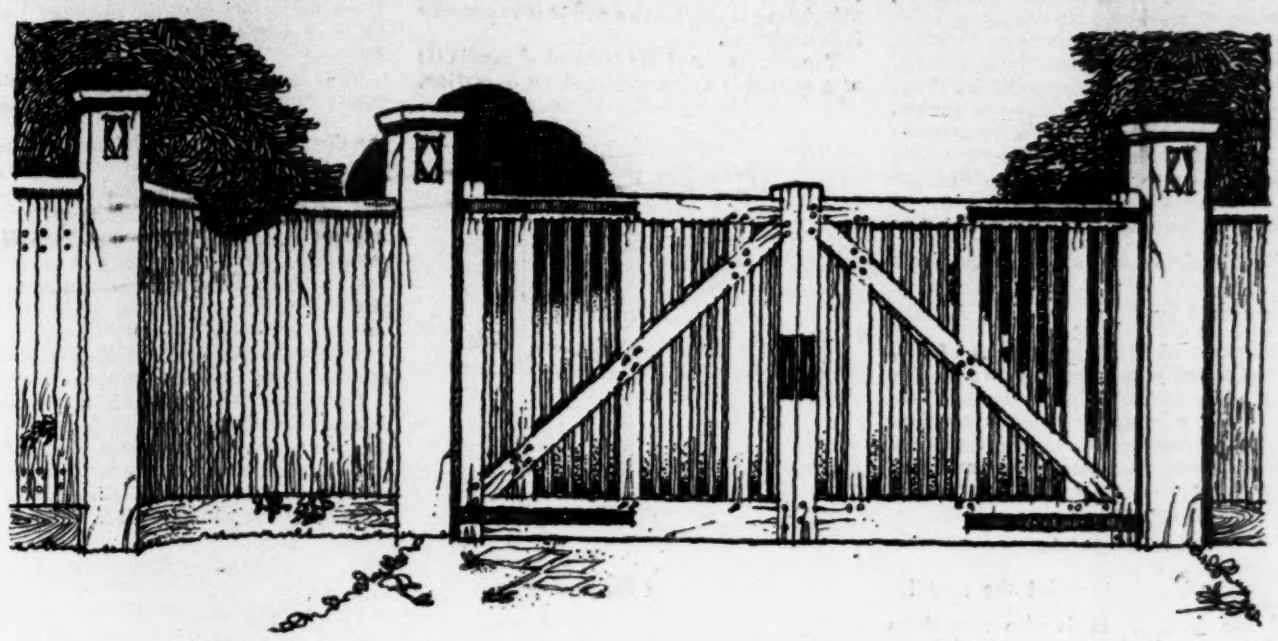


their holes, a
which take
projecting
clearly indi
points:—

1. That t
extended an
2. That t
strained is
above or be
3. That t
of the secti
neither exte

Within th

MONTHLY REVIEW · *of* · CONSTRUCTION



Entrance Gates. (*See Note, page* 49.)
Designed by Mr. A. Jessop Hardwick, F.R.I.B.A. Made by Mr. E. C. White.

NOTES ON SOME DEFINITIONS USED IN STRUCTURAL MECHANICS.—I.

By PERCY J. WALDRAM, F.S.I.

MOMENT OF INERTIA AND SECTION MODULUS.

IN all girders or cantilevers deflected under load the outer layers of fibres in the cross section are obviously being punished more severely than those nearer to the centre or neutral axis. This can be very clearly seen if a number of wires be loosely threaded through holes pierced longitudinally in a model wooden rectangular beam, as in Fig. 1a, the protruding ends being all of the same length. If such a beam be deflected under a load, as in Fig. 1b, the fibres surrounding the wires are compressed in the layers above and extended in those below the centre; but the wires themselves, being loose in

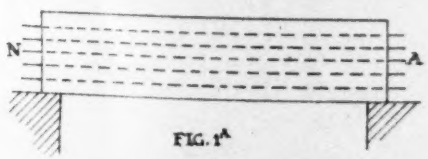


FIG. 1A.

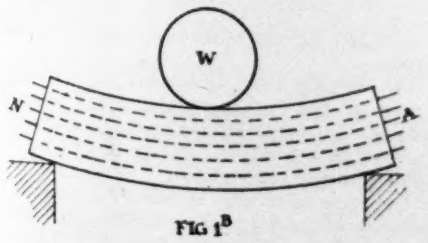


FIG. 1B

their holes, are unaffected, and the alterations which take place in the lengths of their projecting ends when carefully measured clearly indicate the following important points:—

1. That the different layers of fibres are extended and compressed unequally.
2. That the extent to which they are so strained is proportional to their distance above or below the neutral axis.
3. That the fibres at the centre of gravity of the section, viz., on the neutral axis, are neither extended nor compressed.

Within the elastic limit strain is an exact measure of intensity of stress, therefore the stress per square inch upon any horizontal layer of the material of a beam or cantilever under load is also measured by its distance from the neutral axis. If the stress caused by any system of loading on a layer at 1 in. from the neutral axis be, say, 1 cwt. per square inch, then the stress in any outer layer can be deduced from it. At 3 in. from the neutral axis it would be 3 cwt. per square inch, at 5 in. from the neutral axis it would be 5 cwt., and so on. Conversely, if the stress (f) in a layer of outer fibres at 5 in. from the neutral axis be known, then the stress at 1 in. from the neutral axis would be $\frac{f}{5}$.

But the leverage at which the stress in any layer works to resist bending moment is also its distance from the neutral axis; and the effective strength of that layer to resist bending moment is, therefore, determined by its area in cross section multiplied by the *square* of its distance from the neutral axis.

The total effective effort which a beam opposes to bending moment caused by any load, *i.e.*, its moment of resistance [M.R.], expressed in, say, inch-pounds, can be computed by ascertaining the stress in a layer at a unit distance of, say, 1 in. (and therefore working at a unit leverage of 1 in.) from the neutral axis, by deducing from that the enhanced effect of every other layer further away from the neutral axis, and then adding together the different contributions to the moment of resistance thus made by each layer.

Moment of Inertia.

The different layers considered must, of course, be infinitely thin if the calculation is to be mathematically correct, because the top and bottom of a layer of any appreciable thickness would have different values, and the centre would have another value, which would *not* be the mean between the values of the top and bottom.

For instance, in a layer (Fig. 2) 4 in. thick the value of the top lamina would be its area, a × 14^2 or 196a. The value of the bottom lamina would similarly be a × 10^2 or 100a, and the mean of these two values is $\frac{296a}{2}$ or 148a; whereas the value of the middle layer is a × 12^2 or 144a.

For this reason it is customary to employ

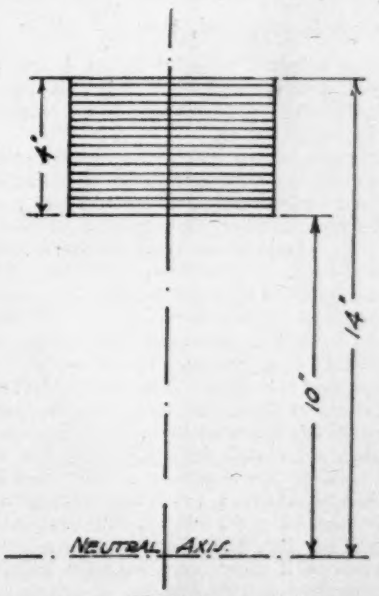


FIG: 2.

an arithmetical short cut provided by higher mathematics, viz., to multiply the stress at 1 in. from the neutral axis by an arithmetical expression which correctly indicates *the collected sum of the areas of each infinitely thin layer in the section multiplied by the square of its distance from the neutral axis.*

Such an arithmetical expression is called the moment of inertia [I.] of the section.

It will be observed that it is an arithmetical expression pure and simple, and relates only to the shape of a cross section. It is not affected by bending moment, span, flange stress, fibre stress, shear, strength of material, or any other consideration whatever other than the dimensions of the cross section. It is the same for a beam of steel 20 ft. long as for a beam of soap 12 in. long, provided they are the same in cross section.

If the stress per square inch in the extreme outer layer of a beam or cantilever under any loading be called f, and its distance above or below the neutral axis y, then the stress at 1 in. from the neutral axis would be $\frac{f}{y}$. The total moment of resistance would be represented by $I \times \frac{f}{y}$ or $\frac{I}{y} \times f$. The total moment of resistance [M.R.] of any cross section of a beam always equals the bending moment [B.M.] which calls it into being. I and y being permanent dimensions fixed by the contour of the section, the stress, both at the outer fibres and elsewhere, must, and obviously does, vary with the severity of the bending moment.

Section Modulus.

The expression $\frac{I}{y}$ is called the modulus [Z] of the section. It is also sometimes termed incorrectly its "moment of resistance in square inches." Like I, it is purely arithmetical, and may be regarded as representing the muscular development of a beam—the inherent capacity of its cross section to develop and use fibre stress in offering resistance to bending moment. The muscles of the beam may be hard or they may be flabby—Z merely tells us their size, not their quality.

Its relationships are as follows:

$$BM = MR$$

$$BM = \frac{I}{y} f = Zf$$

$$f = \frac{BM}{\frac{I}{y}} = \frac{BM}{Z}$$

If f is the extreme intensity of muscular stress which the fibres of the beam can stand without injury, then Zf represents the total muscular effort which the beam can be safely trusted to exert without hurting itself. Conversely, if Z is the muscular development of a beam and B.M. the bending moment to which it is subjected, then $\frac{BM}{Z}$ will be the extreme stress f thereby inflicted on the outermost fibres, which should not exceed the safe working stress which the material can be subjected to.

As there are an infinite number of directions in which a beam can be bent so there are an infinite number of neutral axes, and an infinite number of moments of inertia can be calculated at right angles to those neutral axes.

The majority of beam sections in common use, such as built-up metal beams and rolled joists, have thin webs and broad and comparatively thin flanges. The stress in them varies over the section from the neutral axis to the outer fibre, just as it does in a rectangular wooden floor joist, but they can be *roughly* calculated by neglecting the web and treating the flanges as if they were thin laminæ equidistant from the neutral axis. Thus, in a 12 × 6 I section, with flanges 6 in. × 0·72 in. (Fig. 3), the two flanges might be treated as if they were actually infinitely thin laminæ each of 4·32 sq. in. in area, and situated 5·64 in. from the neutral axis. The moment of inertia of the section would then be approximately $4{\cdot}32 \times 5{\cdot}64^2 \times 2$, and $\frac{I}{y}$ or Z would be $\frac{4{\cdot}32 \times 5{\cdot}64^2 \times 2}{5{\cdot}64}$ or $4{\cdot}32 \times 11{\cdot}28 = 49$, *i.e.*, the same result as would be obtained by multiplying the area [a] of one flange by the effective depth [d] between the centres of flanges, or

$$Z = ad.$$

The actual Z of a standard 12 × 6 rolled joist, including the strength of the web, is 52·573, an error of about 7 per cent. In plate or lattice girders the webs are thinner in proportion to the flanges, and the error introduced by neglecting the web and calculating Z as ad is so small that in practice it is neglected.

The calculation of the moment of inertia (I) of a section is a somewhat tedious operation,

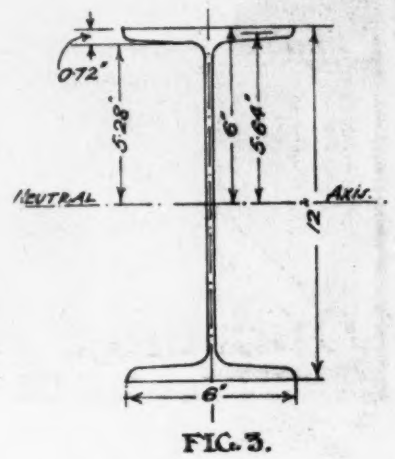


FIG. 3.

and as its chief use in structural mechanics is to deduce the section modulus (Z) in order to obtain the extreme fibre stress by means of the simple equation $f = \frac{B\,M}{Z}$. Z is therefore tabulated for all standard rolled sections in common use, and is calculated approximately (Z = a d) for lattice and plate girders. A moment's consideration, however, will show that Z must have two values in all sections which are not symmetrical about their neutral axes. For instance, in a T section, as in Fig. 4, with a vertical web the neutral axis is generally close up under the table, and the

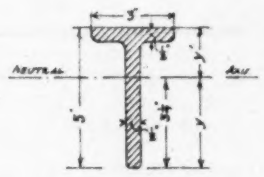
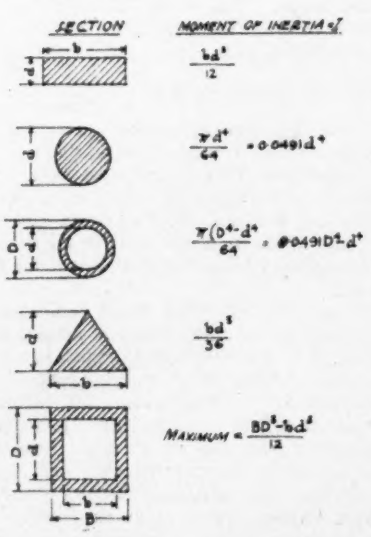


FIG. 4.



distance (y) of the extreme fibres from the neutral axis has two values according to whether the upper or lower extreme fibre is being considered. Such a section has of course, like every other section, only one moment of inertia along the axis yy, but it has *two* values for the section modulus Z, and when under load the expression $\frac{B\,M}{Z}$, which gives the extreme stress in the outer fibre, will have two values, one of which gives the intensity of stress in the tip of the vertical web, and the other the intensity of stress on the back of the horizontal table. The experiment of threaded wires previously referred to shows conclusively that in such a beam of T section under load or deflected under a bending moment these two values must be different.

The values of I for ordinary profiles are shown in Fig. 5. With rectangular sections the distance (y) is $\frac{d}{2}$, and the expression $\frac{I}{y}$ or $Z = \frac{b\,d^3}{12} \div \frac{d}{2}$ or $\frac{b\,d^2}{6}$. This well-known expression, representing the modulus of a rectangular section, can be deduced in other ways which appeal somewhat more easily to the mind, but its direct relation to the moment of inertia should not be overlooked.

To obtain the moment of inertia of any section the arithmetical rule is as follows:—

(*a*) Divide the total section into separate figures of definite shape, such as rectangles, triangles, etc., whose centres of gravity and moments of inertia can be easily ascertained.

(*b*) Ascertain the position of the centre of gravity of the whole section.

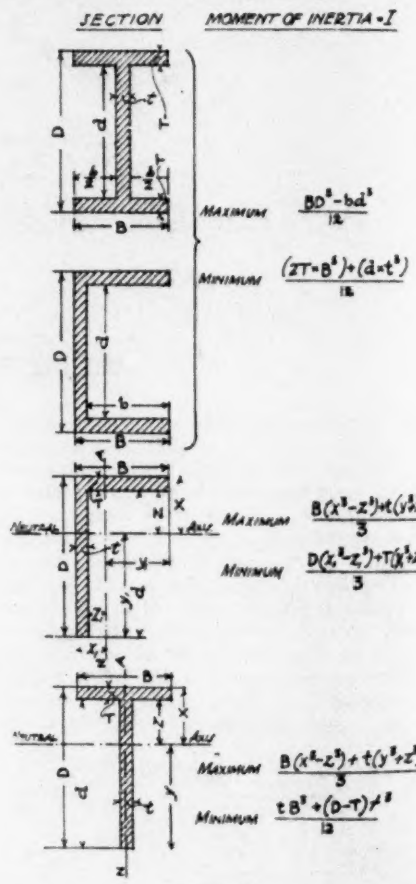


FIG. 5.

(*c*) Calculate the moment of inertia of each figure.

(*d*) Multiply the area of each figure by the square of the distance between the neutral axis of the whole section and a line drawn through the centre of gravity of the figure parallel to the neutral axis.

The sum of c and d will represent the moment of inertia of the section, and this divided by the distance of each outside layer *or of any other layer* from the neutral axis gives the section modulus Z *for that layer*, and enables the stress in it to be calculated from $f = \frac{B\,M}{Z}$.

The use of the section modulus in the practical design of material to resist any given bending moment (B M) is as follows. The fibre stress (f) which the material can safely stand is first fixed upon. Then from the simple equation BM = Zf, the Z or inherent strength of section required to keep down the fibre stress in the outermost fibres to the necessary limit f is determined, and a

section which possesses that muscular development is selected either from tables or by trial and error.

A case frequently met with in practice, which necessitates the calculation of the moment of inertia of a section, is that of a buttress projecting from a wall and subject to lateral thrust from the wind pressure of a steep roof. The tendency of the wind pressure is to set up tension in the back of the wall, and the proportions of the buttress are determined with a view to neutralising this tendency. If the buttress were considered as acting alone the sufficiency of any assumed section could be readily ascertained either by compounding its weight with the lateral thrust and ascertaining that the resultant of the two falls within the middle third of the section, or by calculating the maximum and minimum pressures direct by means of the formula.

$$\left.\begin{matrix}\text{Max.}\\ \text{Mm.}\end{matrix}\right\} f = \frac{W}{A} \pm \frac{M}{Z}$$, where M = the moment of the lateral force and Z for a rectangular section of buttress would be $\frac{b\,d^2}{6}$.

But the buttress is not acting alone—it cannot move without pulling down the wall to which it is bonded. What is really resisting the overturning moment of the forces is not a rectangle but a T section, of which the table represents the wall and the web represents the buttress. The middle third rule will not apply to such a T section, and Z must be calculated for both edges by means of the moment of inertia.

The section is that of a cantilever standing up on end subjected to a bending moment

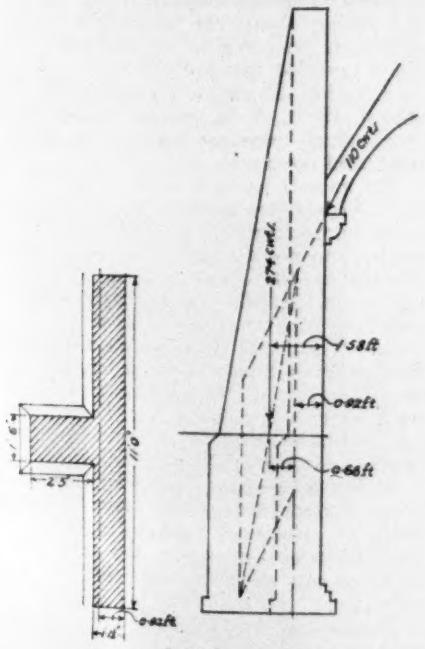


FIG. 6.

which tends to cause tension in the table and compression on the web. It is subjected to an initial intensity of compression $\frac{W}{A}$, A being the area of cross-section and W the vertical component of the resultant forces impinging on that cross-section. In addition it is subjected to a bending moment (M) from the lateral force tending to increase $\frac{W}{A}$ on one side and decrease it on the other. The essential conditions are that $\frac{W}{A}$ shall not be so decreased on the windward side as to be obliterated and tension set up; and that it shall not be increased on the leeward side to an intensity greater than the material will stand in compression. Taking the case of the buttress and wall shown in Fig. 6. The true centre of gravity of the section at the plinth level is found by ordinary calculation to be 0·92 ft. from the inner edge of the wall. The resultant line of thrust is found to be 1·58 ft. from the same point, and the eccentricity or leverage of the resultant thrust is, therefore, 1·58 − 0·92 or 0·66 ft.

The total vertical component of the weight of brickwork and truss is 274 cwts, and the area of the section is 15·8 sq. ft. The intensity of vertical load $\frac{W}{A}$ is, therefore, $\frac{274}{15{\cdot}8}$ = 17·35 cwts. per square foot. The anti-clockwise bending moment of the lateral forces is is 274 cwts. × 0·66 ft., or 108·1 ft. cwts, which tends to increase $\frac{W}{A}$ on the outside edge of the buttress, and to decrease it on the inner side of the wall.

The maximum intensity of pressure at the outside edge is $\frac{W}{A} + \frac{M}{Z}$, and the minimum intensity of pressure on the inside edge is $\frac{W}{A} - \frac{M}{Z}$.

If the tensional intensity represented by $\frac{M}{Z}$ is greater than $\frac{W}{A}$, then tension is set up.

The moment of inertia of the section is as follows:

$$c\begin{cases}\text{I of top of table} = \frac{11 \times 0{\cdot}92^3}{12} = 0{\cdot}712\\ \text{I ,, bottom ,,} = \frac{11 \times 0{\cdot}205^3}{12} = 0{\cdot}008\\ \text{I ,, web} = \frac{1{\cdot}5 \times 2{\cdot}225^3}{12} = 1{\cdot}430\end{cases}$$

$$\overline{2{\cdot}150}$$

$$d\begin{cases}11 \times 0{\cdot}92 \times 0{\cdot}46^2 = 2{\cdot}300\\ 11 \times 0{\cdot}205 \times 0{\cdot}103^2 = 0{\cdot}040\\ 2{\cdot}25 \times 1{\cdot}5 \times (1{\cdot}125 + 0{\cdot}205)^2 = 4{\cdot}450\end{cases}$$

$$\text{I} = \overline{8{\cdot}940}$$

The two values for Z are, therefore, as regards the inner edge, $\frac{8{\cdot}94}{0{\cdot}92} = 9{\cdot}7$,

and as regards the outer edge, $\frac{8{\cdot}94}{2{\cdot}455} = 3.65$,

and the extreme pressures are

Maximum $\frac{W}{A} \pm \frac{M}{Z}$ = 17·35 + $\frac{108{\cdot}1}{3{\cdot}65}$ = 17·35 + 32·5 = 49·85 cwt. per square foot compression and

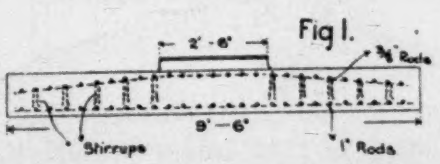
Minimum $\frac{W}{A} - \frac{M}{Z}$ = 17·35 − $\frac{108{\cdot}1}{9{\cdot}3}$ = 17·35 − 11·3 = 6 cwt. per square foot compression.

No tension is, therefore, set up, and the maximum pressure is not unreasonable for good brickwork.

REINFORCED CONCRETE STANCHION BASE.

REINFORCED concrete has many advantages over brick and concrete construction, especially on the score of cubic space saved, a reinforced concrete wall being so much thinner than either a brick or concrete wall, and in many cases, where either of the latter cannot be used and steel joists are employed embedded in concrete (as a protection), savings in both cost and space are made.

All foundations should go down to solid ground, but the necessary depth is often

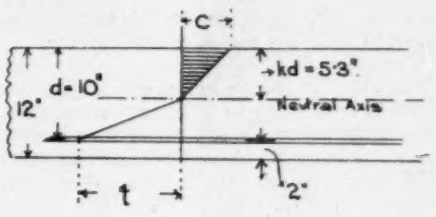


exceeded, due to the thickness of the floor above or the thickness of the stone base, brick footings, and plain concrete necessary for sound construction. For this reason a steel grillage has the advantage over ordinary brick and concrete footings, but reinforced concrete has a greater—less excavation being required, and less steel is employed to perform the same duties.

As an example of this the following example can be compared with the case given in our issue of November 26, 1910, showing a steel grillage base design, the same conditions of loading and size of base being employed. The base being 9 ft. 6 in. square, with a 2 ft. 6 in. base to the stanchion, the overhang of the foundation is 3 ft. 6 in., which can be considered as a cantilever. The safe load on the soil being 2 tons per square foot, this can be considered as a distributed load on the cantilever, the bending moment M being in such a case $\frac{WL}{2}$ where L = the span in feet, or 3 ft. 6 in.

Assume the depth of concrete to be 12 in., and allowing the amount of steel reinforcement to be 2 per cent. of the area of concrete in compression and placed at 2 in. centre from

Fig 2.



the underside of the concrete, we find from Fig. 2 the following particulars:—

Let M = the ratios of elasticity of the steel and concrete to be equal to 15.

Then for 2 per cent. of reinforcement k = ·530, and p = ·02.

Take one strip of the base 1 ft. wide.

Using the Royal Institute of British Architects' formulæ for tension per square inch:—

$$t = \frac{M}{pbd^2\left(1 - \frac{1}{3}k\right)}$$

$$t = \frac{\frac{WL}{2}}{\cdot02 \times 12 \times 10 \times 10\left(1 - \frac{\cdot530}{3}\right)}$$

$$t = \frac{2 \times 3\tfrac{1}{4} \times 3\tfrac{1}{4} \times 2240 \times 12}{2\,(\cdot824)}$$

$$t = 16650 \text{ in. lb.}$$

$m = \frac{Et}{Ec} = 15$.
M = Bending moment.
Ec = Modulus of elasticity of concrete.
Et = Modulus of elasticity of steel.
L = Span in feet.
p = Percentage of steel in area of concrete stressed.
c = Compression in concrete per square inch.
t = Tension in steel per square inch.

The maximum allowable tension per square inch on the steel being 17,000 lb., the above stress is within safe limits, therefore 2 per cent. of steel is sufficient to take the tension.

The area of steel required = $\frac{2}{100}$ of bd = $\frac{2}{100} \times 12 \times 10 = 2\frac{3}{5}$ sq. in.

Three 1-in. diameter rods are sufficient to supply this area of steel required within the 1 ft. breadth of base under consideration.

Considering the concrete under compression which is at the upper surface of the slab, we get the compression per square inch from:—

$$C = \frac{\frac{2M}{kbd^2\left(1 - \frac{1}{3}k\right)}}{} = \frac{2\left(\frac{WL}{2}\right)}{kbd^2\left(1 - \frac{1}{3}k\right)}$$

$$= \frac{2\,(2 \times 3\tfrac{1}{4}) \times 3\tfrac{1}{4} \times (12 \text{ in.} \times 2240 \text{ lb.})}{2 \times \cdot530 \times 12 \times 10 \times 10\left(1 - \frac{\cdot530}{3}\right)}$$

$$= \frac{3\tfrac{1}{4} \times 3\tfrac{1}{4}}{\cdot530 \times 5 \times \cdot824}$$

$$= 1257 \text{ lb. per square inch.}$$

But the allowable compressive stress on the concrete is 600 sq. in. lb., therefore steel rods might be introduced to take the surplus compression. The centre of gravity of the compressive stress acts at $\frac{1}{3}$ kd from the compressed edge = $\frac{1}{3}$ × 5·32 in. × say

2 in. This gives 8 in. to the centre of the steel rods in tension. See Fig. 3.

The area in compression being kdb, the total excess of compression (1257 — 600) equals kbdc or 5·32 × 12 × 657 lb. = 41,785 lb.

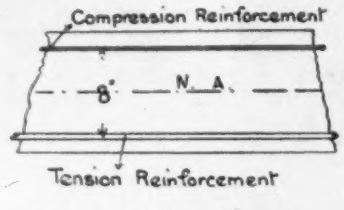


Fig 3.

The moment being 8 in., therefore

8 in. × c × area of steel = 41,785 lb.
8 × 16,000 × A ... ... = 41,785
128,000 A ... ... = 41,785
A ... ... = $\frac{41,785}{128,000}$
A ... ... = ⅓ sq. in. area.

Three ¾-in. rods in every foot of breadth of concrete will, therefore, be ample reinforcement to meet the excess of compression.

Expanded metal or wire mesh would answer admirably for this purpose, and would lend itself to advantage to facilitate construction. The concrete immediately under the stanchion being directly in compression, and carrying 180 tons, we get this distributed over an area of 2 ft. 6 in. × 2 ft. 6 in. = 900 sq. in., giving = $\frac{180 \times 2240 \text{ lb.}}{900}$ = 448 lb. per square inch.

This would be quite safe, but, as a precaution against a tendency to burst, this portion might have a "square helix" of steel placed horizontally therein, say ¼-in. diameter wire, as shown in Fig. 4.

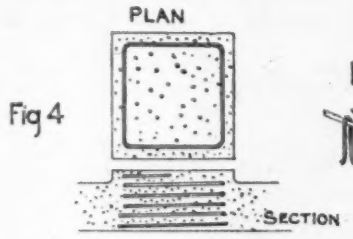


Fig 4

Fig 5.

In the general construction of ferro-concrete work the vertical rods in the column pass into the base, but, as a steel stanchion is being used in this case, its base will have to be specially attached.

This can be done by placing fixing-bolts in the mould and allowing them to set in position with the concrete. The cast-iron base can then be bolted on with ease.

To take any shear in the concrete, it is usual to introduce vertical members or stirrups. These can be placed as shown in Fig. 5.

Now, as to the amounts of materials employed in each case, first the saving in excavation is 2½ cubic yds. in favour of the reinforced concrete.

The steel employed in the steel grillage is over 9 cubic ft. against a bare 3¼ cubic ft. in the reinforced concrete base. The concrete used in the steel grillage equals 126 cubic ft., whilst in the reinforced concrete base 90 ft. only are used.

Thus all the way round there is a saving in favour of the reinforced concrete base. To support the upper reinforcement during setting, bent bars, as shown in Fig. 6. can be employed, and the compression attached to them by wire to secure them in proper position and prevent their displacement during ramming.

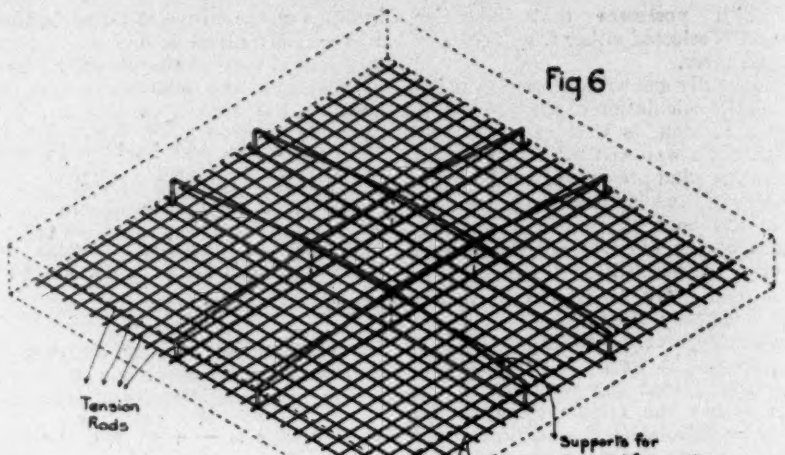


Fig 6

EXHIBITION BUILDINGS:

IV.—REINFORCED CONCRETE (INDENTED BAR SYSTEM).

As most of our readers are doubtless aware, a prominent characteristic of the indented bar system of reinforced concrete is the employment of steel in the form of either square or round bars, rolled with indentations with the object of affording a direct mechanical bond between the concrete and the steel. The indentations are so arranged that the sectional area of every bar is the same at any point of its length, so that no steel is wasted, as would be the case if there were projections or depressions increasing or decreasing the quantity of metal at various points.

Bars of this type can obviously be used in conjunction with any suitable arrangement of the reinforcement, and therefore impose no restriction on the architect or engineer in respect of the details of his designs. As the provision of a secure mechanical bond is the main object of the indented bar, this variety of reinforcing metal might be produced in mild steel just as appropriately as in high-tension steel, and we believe that the patentees are willing to do so to meet the requirements of designers. But as a general rule they prefer the employment of high-tension steel with an elastic limit of at least 50,000 lb. per square inch, in order that the economy which is claimed for such material in connexion with a continuous and positive bond may be fully realised.

So far as exhibition buildings are concerned, the only structure of which we have cognisance as embodying the indented bar system is the Stadium built for the Franco-British Exhibition, and still to be seen at Shepherd's Bush. The framework of the structure is of ordinary steel, while the risers and platforms, affording sitting and standing accommodation for spectators, are of concrete reinforced by indented bars, the whole of the reinforced concrete work having been executed by the Empire Stone Company.

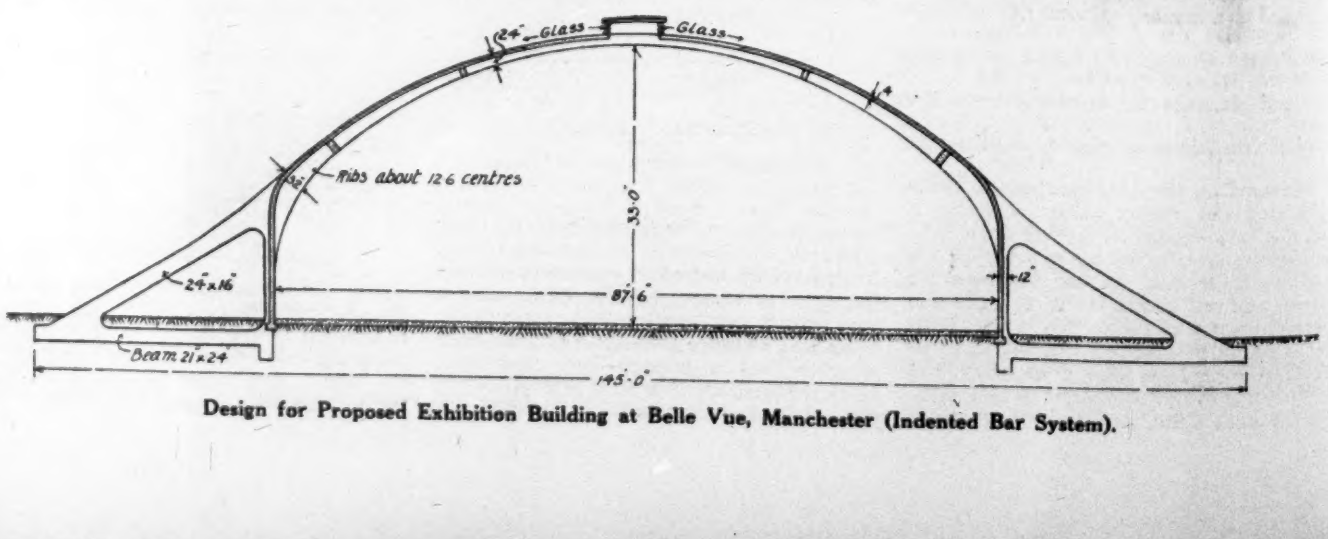
The accompanying section illustrates a design prepared by the Patent Indented Steel Bar Company, Ltd., for a reinforced concrete exhibition building. One merit of the design from the standpoint of the exhibition promoter is the absolutely clear space provided between the outer walls by constructing the roof as a series of arch ribs, spaced 12 ft. 6 in. apart, connected by longitudinal members and a thin slab of reinforced concrete.

The interior space is 87 ft. 6 in. wide by 33 ft. high at the centre, while the building could be continued to any required length by adding the necessary number of arch ribs. The ribs are 16 in. wide by 32 in. deep at the springings, and 18 in. deep at the crown, including the thickness of the connecting slabs. The thrust of the arch is taken by a triangular abutment at either end, the vertical members in the abutments acting as wall columns between which the roof slabs are continued down to the ground as panels closing the sides of the building.

With the exception of glazing, doors, and other interior fittings, the structure is entirely of reinforced concrete, affording an absolute safeguard against fire risks, so far as these can be obviated by building construction.

Considering the magnitude of the roof span, the arch ribs are of slender proportions, and as the roof slabs and side curtain walls are only 4 in. thick, the cost of the work should be very moderate.

The projecting buttresses necessarily occupy a good deal of space, but we may point out that this apparent disadvantage could readily be overcome by enclosing each line of buttresses with light walls and by



Design for Proposed Exhibition Building at Belle Vue, Manchester (Indented Bar System).

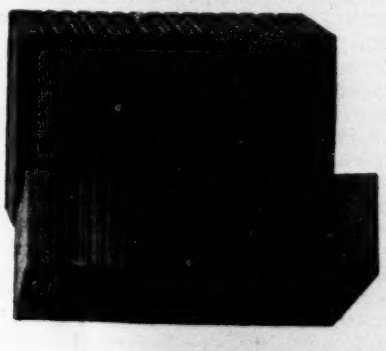
constructing a terrace roof over the interior space so gained. In this way two side galleries could be secured for additional exhibits, with a passageway for visitors close to the walls of the main hall, and a series of bays nearly 12 ft. wide for the reception of goods and articles for exhibition. The galleries might be connected with the main hall by omitting the curtain walls between columns, the material thus saved being applied to the outer enclosure of the side galleries. Further, by utilising the gallery roofs for refreshment purposes an additional source of revenue would be secured.

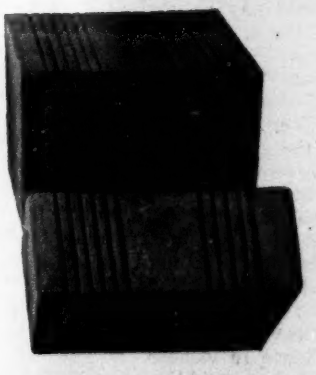
We are afraid that a monolithic building of this class, in common with kindred structures representing other systems of reinforced concrete, may not appeal to the promoters of exhibitions demanding accommodation at the lowest possible initial cost. But for important exhibitions intended to remain open for the best part of a year, and possibly to be followed by kindred displays on the same site, a building of the type under consideration ought to be appreciated for the valuable safeguards it affords to proprietors, exhibitors, and the public.

The indented bar system of reinforced concrete has been applied to the construction of various pier pavilions and other structures which are not essentially different from exhibition buildings in respect of design, and are sufficient to show that the system could readily be applied to the class of buildings considered in the present series of articles.

THE BALG HOLLOW BRICKS.

We give herewith an illustration showing the Balg Hollow Bricks closed on all sides, which are useful for walls and partitions where lightness is desired. When using hollow bricks with open ends for ceiling construction, the space between each pair of adjacent bricks is closed by a cardboard tube to prevent mortar entering these hollow spaces. When mortar is poured between the bricks these tubes





Hollow Bricks Cut Open.

form a core round which the concrete flows; consequently, there are no solid concrete ribs, the same being interrupted at certain intervals by circular holes. A solid rib is, however, of the utmost importance for the carrying capacity of the ceiling. The above-mentioned cardboard tubes prevent the liquid concrete from falling down unhindered from the upper surface of the ceiling to the lower surface. With this old system of open bricks, the period taken by the concrete is a comparatively long one before reaching the lower surface of the ceiling. Thus the liquid in the concrete has a tendency to become absorbed by the surface of the brickwork, so that the concrete is not likely to completely surround the iron rods. With this system the concrete flows unhindered direct to the lower surface, and closely surrounds the iron rods, this gives the ceiling durability and strength, and absolute safety in carrying capacity.

By the advantage of the system over others—viz., continuous solid concrete ribs, and the iron rods being closely surrounded with concrete, so that the iron cannot rust—the greatest durability and strength possible is obtained, the more so as everything is open to inspection, the whole construction being visible up to the finish, whereby the possibility of faulty construction is excluded.

CONSTRUCTION NOTES.

Entrance Gates. First impressions are important, so in arranging approaches the suitability of gates should be considered. It is not always possible for an architect to design his own gates, nor is it necessary in many cases; ready-made work of good appearance and stability is obtainable. For instance, Mr. A. Jessop Hardwick, F.R.I.B.A., having given special attention to the subject, has produced a series of designs, one of which is shown on page 45. It is taken from the "Book of Gates," an illustrated catalogue issued by Mr. E. C. White, the Steam Saw Mills, Canal Wharf, Basingstoke.

Settlement in Strasburg Cathedral. In a Report dealing with the crack which has opened in one of the main pillars in the central nave of Strasburg Cathedral, M. Knauth, the cathedral architect, states that the chief cause is the defective condition of the foundations beneath the north tower. These foundations, constructed of rubble and cement on argillaceous soil in which some timber piles had been driven, consist of two walls running north to south and east to west. The piles are badly decayed, and the interior pillar of the tower is said to be virtually unsupported for a length of 2 metres, as a layer of vegetable earth is interposed between the foundations and the base of the pillar. Like many fabrics of the same class in this country and elsewhere, Strasburg Cathedral was built in different epochs, one result being that the foundations have now to carry loads much greater than those contemplated by the original designer. This point is illustrated by the statement that the present foundation load is upwards of 25 tons per square foot. The remedy proposed by the architect is the underpinning of all defective foundations.

Bonded Concrete Blockwork. On this page we illustrate two forms of concrete building blocks and a system of laying these so as to constitute hollow walls, where the two shells are bonded together and each face is finished with a bond of the Flemish type, as shown by the elevation.

The blocks are of two sizes, one measuring 7¾ in. cube, and the other 23¾ in. long, by 7¾ in. high, by 3 in. thick. They are laid alternately in each course, where the cubes give the appearance of headers and the long thin blocks represent stretchers. On reference to the sections it will be seen that the cubes in successive courses are supported along the outer side by the long blocks, and along the inner side by the cubes projecting inwards from the opposite face of the wall. The solidity of the construction is made clear by the section through A—B, the continuous vertical air-space is shown by the section through C—D, and the continuous longitudinal air-space by the two horizontal sections.

Any finish can be given to the outer face of the blocks, the size of which may be modified as desired. If preferred, the interior cavity could readily be filled in with rough concrete or other material.

Granolithic Floor Surfaces. The following is a specification which has been widely adopted in America for hard-finished concrete floors:—

This specification is adapted for work in localities where tough stone is available; local conditions will govern the selection of other materials.

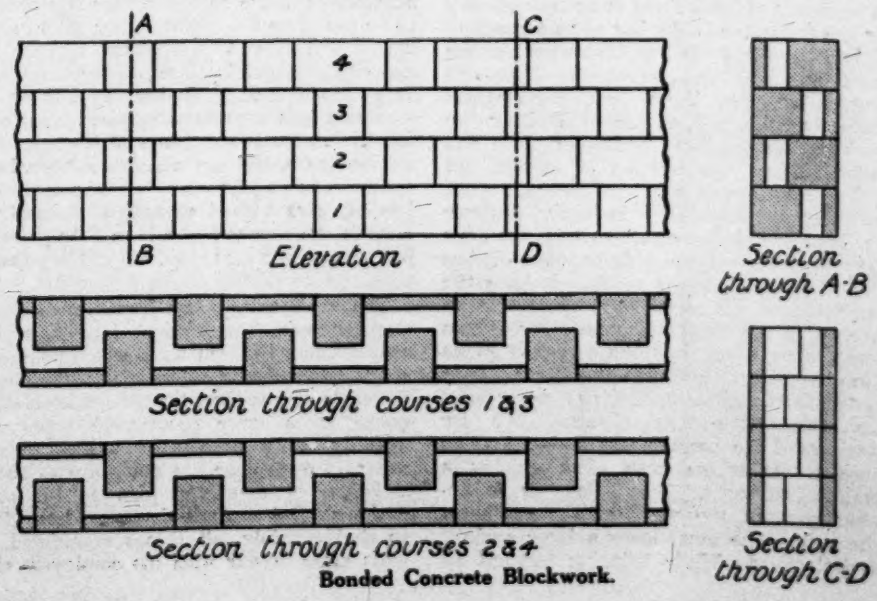
If the surface is to be laid upon an unset concrete base, the specifications should require that it be laid as soon after the base is in as may be, and, if possible, before the under concrete has set, so that the base and the finish shall bond together; otherwise the specification will apply.

Mixture of the top finish should be in the proportion of 1 part Portland cement, 1 part stone from ½ in. to the smallest size, excluding dust, and 1 part sharp sand (no grains passing a 50 screen, the majority of sizes which will pass between a 20 and a 30 screen). This shall be mixed to a stiff paste, just wet enough so that in trowelling the water will barely work to the surface.

Base.—If old concrete, the surface shall be roughened either by sand blast, acid treatment, or other equally satisfactory method of cleaning the stones so that the mortar shall adhere to them. The under concrete shall be thoroughly wet, and shall be kept wet long enough to absorb all the water it will take up readily, thus ensuring a base so wet that it will not draw water from the finish when the latter is applied. Before scrubbing the base with grout the excess of water shall be removed, so that the finish shall not become too wet.

Finish.—The surface of the base shall first be scrubbed with a thin grout of pure cement rubbed in with a broom. On top of this, before the thin coat has set, a thin coat of finish, mixed as above specified, shall be trowelled hard, using as much pressure as possible, and rubbing the finish hard down on to the roughened base so that it shall take firm bond. After this the finish shall be applied of the desired thickness, screeded, and floated to a true surface. Between the time of the initial and final set it shall be finished by skilled workmen with steel trowels and worked to final surface. Under no condition shall dryer be used, nor shall water be added to make the material work easily.

If the finishing is done in hot weather, the finish shall be protected from sun and wind in order to prevent too rapid setting.



Bonded Concrete Blockwork.

THE BUILDING TRADE.

HELPMEETS.

THERE are two individuals upon whom the success or otherwise of a contractor depends, neither of whom in our opinion receives the full credit due to him. To mention them in the order in which their work is done—the first is the estimating clerk, and the second the foreman. In the case of the first-mentioned the term "clerk" seems hardly to suggest the importance of his office. It is his knowledge and judgment that his employer first depends upon in obtaining the work at such a price as to be remunerative but sufficiently low as not to put him out of court in competition. To a good estimator it is as unsatisfactory to find himself a long way below the second tender as to find himself a long way up the list. Hence the margin in his work is a very narrow one. But the gross amount of the tender is not the only matter for consideration. It is just possible that, by relying upon the law of averages, a most slovenly and incompetent estimator may come out all right in the list of tenders, but when it comes to settling the bill of variations the difficulties begin. Occasionally even then the result works out to the advantage of the contractor, but the contractor whose business is of a sporting nature rests upon a very unstable foundation. Any one who has had the slightest experience in settling accounts, when the pricing of the original bills has been erratic and inconsistent, will appreciate the situation which arises from such pricing—endless disputes, and dissatisfaction all round. In isolated cases it may be that there is a motive in this system of pricing—generally with a supposed knowledge of what the future variations may be, but we are happy to believe that these are exceptions and not the rule. Our experience has been that where a bill has been carefully and consistently priced, the work of settling up most complicated accounts is reduced to a minimum. Even where items do not exactly apply, it is possible to arrive at a value of other items by a system of analysis. To arrive at this exactitude in pricing, the estimator must be a walking encyclopædia—he must be well versed in the market rates of materials, because often, in these days of rush, it is impossible to obtain special quotations. He must also be quite conversant with the constants of labour under varying circumstances. Even then his work is by no means mechanical, as there are so many factors to be taken into account in arriving at the proper value of the work estimated for. Obtaining the work for his employer is not the only part of his occupation. One of the best systems we know, is to put the work under the control of the person who estimates, and here there is an opportunity for the estimator to display some amount of diplomacy, for while keeping control of the work he must not usurp the foreman's prerogative, for, if he does, trouble will certainly arise, and, so far from either the work or the employer benefiting, both will suffer. When this system is carried out and the estimator and the foreman work amicably together—and in every instance we have knowledge of where this was done they have worked amicably together—it has had a most admirable result. It puts the estimator on his mettle and gives him an interest in the work which no other system does. How often does the surveyor go on a job to settle the accounts and finds that the contractor's representative has never seen the work until that moment. We are speaking of the average contract—not those large works where both sides employ a qualified surveyor. This brings us to another part of the work of the estimator where again he must show a large amount of diplomacy. While bringing forward all the claims his employer is justly entitled to, he should avoid, as far as possible, those of a paltry and vexatious nature, which sometimes result in opening questions which work out in an entirely different manner to what he intends. Of course this applies to both sides. Both parties should recognise the term "variations" in settling accounts, rather than the term "extras" on the one hand and "omissions" on the other. To arrive at a satisfactory conclusion, the estimator should be something of a surveyor, and, although he need not be so fully qualified as one who has to prepare bills of quantities for competition, he should know sufficient of the practice to be able to meet the surveyor on his own ground in measuring. The system we have mentioned enables him to do this with some degree of certainty as, having been in touch with the work all through, he has a fair idea as to what the variations are. We are well aware that slovenly and incompetent surveyors will not welcome this suggestion as it tends to show up their weaknesses in a very bright light, but we are only concerned with those practitioners who do their work honestly and thoroughly, and with an eye to something more than the item at the close of the summary.

In the foregoing remarks we think we have shown the importance of the work of the estimator, what a many-sided individual he undoubtedly is—or should be. And our experience is, however keen he may be, provided he keeps within the line of strict fairness, and provided also that the surveyor he meets is fully qualified and conscientious, there are fewer appeals to arbitration, fewer grumblings as to losses, and, as a natural result, general satisfaction and a continuance of association which should be the aim of all concerned.

Having dealt with the estimator, we now come to the other individual in whose hands the fortunes of the contractor to a large extent rest. Within the last twenty years there has been a great change in the personnel of the foreman. On comparatively rare occasions one does meet with the middle-aged "practical" man. One who depends very largely upon experience rather than academic training, and this type of foreman is by no means to be despised; true, many of his methods must be denominated "rule of thumb," but they are none the less reliable on that account. True also that he is not often much of a penman—years of working has militated against his penmanship—and he will measure off an eighth-scale drawing with a 2-ft.—and in the north with a 3-ft.—rule, but he measures correctly, to the great amazement of the onlooker. He is generally to be found on the works rather than in the office, and has a marvellous facility for grasping the qualifications of a workman in a very short time. He has a number of regular hands who have followed him from job to job for years, many of them on the border line of the age which the "hustler" considers to be past work, but who nevertheless can give a good account of themselves. Such is the foreman who is rapidly passing, but who, we venture to say, will still be popular with the architects of his generation.

The essentially modern foreman is a much younger man, the product largely of the polytechnic combined with a comparatively short period of practical training. He affects the scale rather than the 2-ft. rule, is altogether of a more progressive type, and possibly more acceptable to the young architect even if he has not quite so happy a knack of managing men as his older *confrère*. But modern times, modern ideas, so that possibly, all things considered, he finds more favour with his employers than the type previously mentioned. He is, however, more self-assertive, which is a doubtful advantage, as the average architect likes to have a man to carry out his ideas without "improvements," and that the older man generally did—at the same time, if asked for an opinion upon some small matter of construction could often give useful advice. But we are looking at the foreman now as the helpmeet of the contractor, rather than of the architect. Looked at calmly, one must be struck with the many matters that must be considered if a job is to go on smoothly, and at the same time "pay," because, after all, contractors are not philanthropists. Above all, he must be a good organiser, so that things follow in their proper sequence; to arrange to have materials in as they are wanted, and not find roof materials lumbering up the site, while excavations are going on, or the walls being built. We have seen confined sites occupied by steelwork at any early stage, the steel not being wanted for weeks, a thing that might easily have been avoided with a little foresight—although this is sometimes more the fault of the "office" than of the person in charge of the works. There is one item—in fact many items—that affect the total cost of the work, and that is that of "waste." When one sees a number of "short ends" of timber about a job, stacks of bricks after the brickwork is finished, and odd pieces of lead left about, it always seems that there must be some weakness in the system of ordering. This, in our experience, is avoided in the system before mentioned, a co-operation between the foreman and the estimator. Where this has been carried out, the finish of the work has found the site practically clear—consequently the percentage of "waste" is very small indeed. It is the usual experience that of this "waste," very little gets back to the "yard"—even of that which is of value. A good deal of discretion is necessary in regard to the number of men employed; sufficient to get the work through with proper dispatch, but not too many, or the effect will be to delay rather than accelerate the progress. Then a careful record should be made of all daywork jobs, about which there should be no dispute if put in regularly. One of the best estimators we have ever met always chose to have work measured at the contract rates where possible—arguing that if the work is properly estimated it should pay as well as daywork, and is, in addition, above suspicion, as architects have a habit of "kicking" at daywork returns. Then, as a final qualification, the useful foreman should not be *too* self-assertive, but should do his best to get on with the architect and that other individual who *is* sometimes trying, the clerk of works. Our experience is that a good foreman seldom has any difficulty in this respect, although, of course, there are exceptions in this as in other matters.

While we do not wish to teach contractors how to manage their business, we trust that these results of observations during a long experience in various parts of the country may tend to avoid the friction that does sometimes occur, even with the best intentions on the part of all concerned, by a consideration of those little matters, which, though small in themselves, loom large in bulk.

TWO DECEASED BUILDERS' ESTATES.

Mr. Joseph Duffy, of The Green, Wallsend, builder and contractor, and Mayor and Councillor of Wallsend-on-Tyne, who died on July 29, aged sixty-two years, has left estate valued at 123,642*l.* gross, with net personalty 2,491*l.* Mr. Francis Cooper Birch, J.P., of Clovelly, Christchurch-road, Winchester, and formerly of Farnham, Surrey, builder, who died on October 9, aged seventy-eight years, has left estate sworn as of 107,180*l.* gross value, with 100,728*l.* net personalty.

THE LONDON BUILDING ACT.

"STRUCTURES" AND "PROJECTIONS" AND BUILDING LINE.

THE question was raised before a Metropolitan Police Magistrate, recently, whether a projecting iron canopy or framework erected over the entrance to Messrs. A. & F. Pears's premises in New Oxford-street, which was 18 ft. long and projected 4 ft. 6 in. from the front of the building, and which had been erected without the consent of the London County Council, was an infringement of sects. 22 and 73, subsect. 8, of the London Building Act, 1894. The magistrate held that it was a permarent structure, made part of the building, incapable of being removed without taking down part of the structure of the building, and on those findings he made an order for its removal.

The law on this subject is very complicated, and hence very unsatisfactory, a number of decisions having been given on these two sections in the High Court, in which somewhat diverse views have been expressed. In Hull *v.* London County Council (1901), a wooden case for electrical advertisement signs was attached to the wall of a building by iron brackets, a space of 6 in. intervening between the case and the wall. Proceedings were taken under sect. 73, subsect. 8, which provides that, except so far as permitted in this section in the case of shop fronts and projecting windows, and water-pipes, casings, cornices, etc., and like architectural decorations, "no projection from any building shall extend beyond the general line of buildings in any street except with the permission of the Council after consulting the local authority." The Divisional Court unanimously held that the whole of sect. 73 only applied to projections forming part of the buildings in the nature of architectural projections, and that the words in subsect. 8, "no projection from any building," are used in the same sense.

In the case London County Council *v.* Illuminated Advertisements Company (noted, the *Builder*, May 21, 1904), proceedings were taken under sect. 22, the erection being advertisement cases constructed of sheet iron projecting 10 in., and supported on iron supports passed through the front main wall of the building. The Divisional Court, Mr. Justice Wills dissenting, refused to disturb the finding of the magistrate, that this was not a "structure" erected beyond the building line under sect. 22, as they held this to be a question of fact, and that the evidence justified the magistrate's decision; but all the members of the Court expressed dissatisfaction with the decision in Hull's case, and intimated that had the proceedings been taken under sect. 73 this erection might have been deemed a "projection." In London County Council *v.* Schowzek (noted, the *Builder*, November 11, 1905), proceedings were taken under both sections in respect of a structure of iron, filled in with leaded glass at the front and sides, projecting 4 ft. 6 in., bolted to the wall and with two stays, which latter rods went right through the wall. The magistrate dismissed the summons, and the Divisional Court held that the erection was neither a "structure" within sect. 22 nor a "projection" within sect. 73, subsect. 8; but as regards this latter point, two out of the three judges expressed some dissatisfaction with the decision in Hull's case, but felt bound to follow it as it was the decision of a Court of concurrent jurisdiction.

In London County Council *v.* Hancock & James (noted, the *Builder*, April 6, 1907), a show-case was held not to be a structure within sect. 22, the magistrate having so held, but one of the three judges intimated that had it not been for the decision of the Court in the case referred to above—London County Council *v.* Illuminated Advertisements Company—he would have held it to be a "structure." In the case Rex *v.* Denman, *Re* Palace Theatre Company (noted, the *Builder*, April 27, 1907), the magistrate had found an erection a "structure," and he declined to state a case for the opinion of the Court. On an application for a mandamus to compel him to do so, the Court declined to make the order on the ground that this was a question of fact and there was evidence to support the magistrate's finding.

This review of the cases shows the extremely unsatisfactory state of the law on the subject. The decision of what is a "structure" and what is a "projection" within the meaning of the Act as a question of law has created a division of opinion even in the High Court, and in deciding questions of fact based on statutes the magistrates require guidance as to the principles to be applied so that uniformity in the decisions may be attained. If Hull's case could be reviewed by the Court of Appeal, as the Divisional Court judges have often desired it should be, some definite conclusion might be arrived at, but at present there is such uncertainty in the law that it is a considerable drawback to both those who have to enforce the provisions of the Act and those who are subject to those provisions.

It only remains to add that in some of the above cases suggestions were made from the Bench that sect. 119 of the Metropolis Management Act, 1855, might apply when erections were neither "structures" nor "projections" within the London Building Act, 1894. The County Council appear not to have proceeded under that section, and the reason may be that, although the very erections the subject of the above decisions are particularised in that section, the section only gives a remedy where they "shall be an annoyance in consequence of the same projecting into or being made in (*sic*) or endangering or rendering less commodious the passage along any street," far more narrow grounds of objection than those provided by the London Building Act.

SPECIALISTS.

WE have received a communication from Mr. J. E. Yerbury, architect and surveyor, Queen-street, Cheapside, E.C., in connexion with the employment of specialists under building contracts. He says:—

"It is the practice, of course, to provide for special works, either as provisional amounts or as prime cost sums—clauses 27 and 28 of the R.I.B.A. Contract, or Form of Agreement—and the point I wish to raise in this, viz.:—In the event of the failure of the contractor, is the specialist a preferential creditor? In dealing with this question clause 20 of contract must be read with clause 28. I have been interested in many cases where this question has been a serious one, and to illustrate the difficulty I will refer to a case in which I was called in to advise a trustee in bankruptcy. In this particular case the contract was the R.I.B.A. Form of Agreement. The architect had in every instance chosen the goods to be supplied under provisional sums—clause 28 of contract—and had written to the builder as follows, viz.:—'Please order, *on your own behalf*, of Messrs. Blank & Co., the following goods.' (The underlining is copied from original.) The builder ordered, the goods were supplied by the merchants, and the builder's account debited in the merchants' books. Certificates were given by the architect, and monies paid by the employer, which should have included the provisions, and should have been paid to the specialists, who secured notice from the architect.

"The builder became bankrupt, and the specialists applied to the architect for payment, and he paid, the accounts amounting to a large sum. The trustee asked me to express an opinion, which I did; he then took legal advice, which supported my opinion that the architect was wrong. We went to arbitration (the arbitrator being an architect) and we lost.

"Now, sir, there is no question, I think, in this case the trustee ought to have won. Under the Contract clause 20 the specialists were sub-contractors; under clause 28 they are to be paid by the contractor; and in this case the architect divested himself of all liability to pay by insisting upon the builder giving the orders *on his own behalf;* the merchants debited the builder's account, and never looked to the architect personally to pay. (How could they? He had never ordered any goods.) Further, the architect had certified the amount due, and had informed the merchants that he had done so, and left them to obtain payment from the builder. The employer had paid the builder, but the specialists failed to obtain payment, and appealed to the architect. The architect, feeling that (as he had chosen the goods and directed the builder to order from these firms) his good name might suffer if they went unpaid, made them preferential creditors by paying them; and a brother architect justified him when called upon to act as arbitrator, *to the prejudice of all the other creditors.*

"Why should not special firms take the ordinary trade risks which other merchants have to take in the conduct of their business?

"One other illustration:—An architect friend of mine asked for advice in a case where he had chosen the provisional goods, and, his client failing to pay, the merchants demanded payment from the architect personally. The merchants knew him as an architect; were informed for whom the goods were chosen; they knew the architect chose the goods *as agent for another.* On the facts I advised my friend to fight, but he preferred peace, and paid.

"It may be said that you can avoid all these pitfalls by being careful to put everything into writing, but I assure you, sir, that it would be necessary to keep a very good lawyer always on the premises to draft the necessary documents which would avoid all risk under a building contract.

"I think the Institute might easily improve the one usually in force in London."

THE LATE MR. J. HOWARD COLLS.

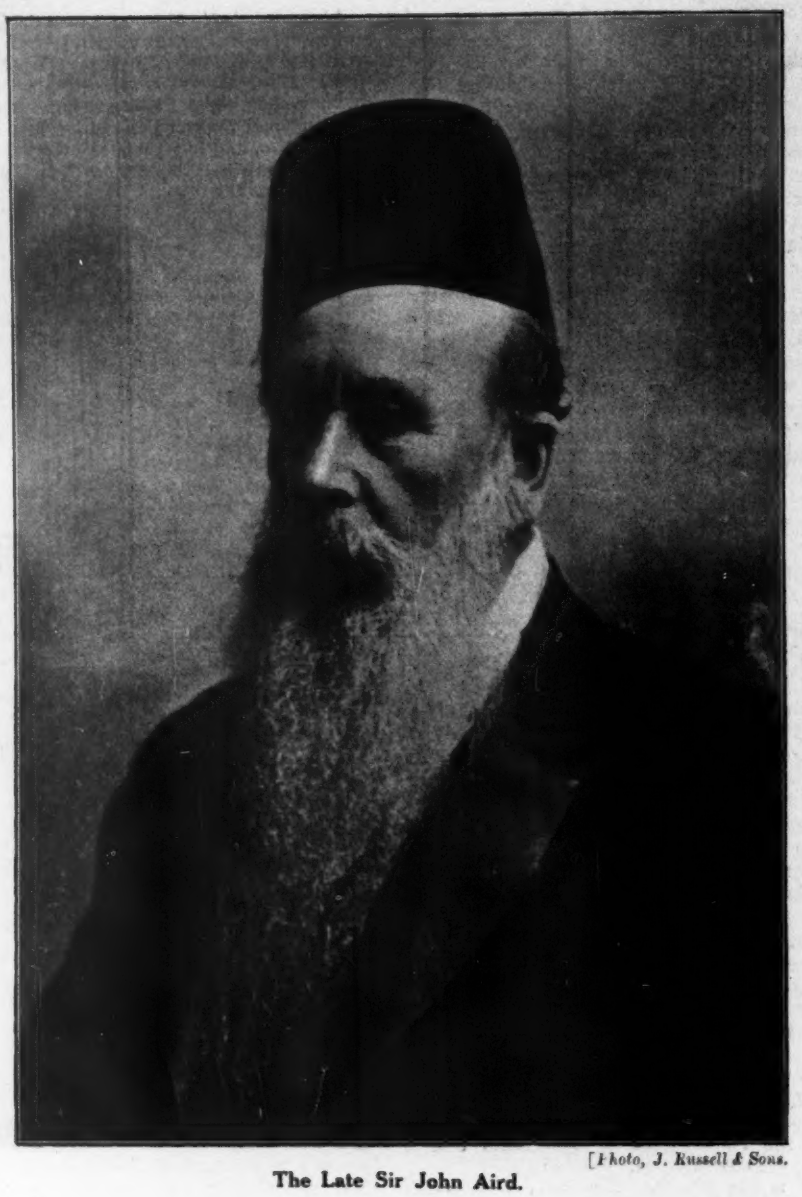
WE have received the following appreciation of the late J. Howard Colls by Mr. William Woodward, F.R.I.B.A.:—

"An uninterrupted friendship of over thirty years enables me to write a few words which, I am sure, will be heartily endorsed by all who had the pleasure of knowing our departed friend. Five minutes' conversation with him would convince all that they were speaking to a singularly keen-witted, humorous, and refined gentleman. His ready grasp of figures relating to his extensive business; his power of rapid criticism of works of architecture and of art generally; his voracious appetite for literature; and his love of Imperialism constituted him a most pleasant companion. Even, however, when dealing with controversial subjects, political or social, J. Howard Colls, although decisive and serious, never thrust before his opponents his views in an unpleasant form; there was always the bright twinkle in his eye, and the satirical retort courteous was invariably at the tip of his tongue. To the building world generally he has left a lasting memento in the courage with which he took up to the House of Lords the celebrated case of the Home and Colonial Stores *v.* Colls, the decision in which has conferred so much benefit upon those who have to deal with cases of ancient lights; and it was at the invitation of Mr. Chamberlain that Mr. Colls became a member of the Tariff Commission. The French expression, 'Sans peur et sans reproche' thoroughly fits the character of J. Howard Colls."

The photograph of Mr. Colls from which we took the illustration appearing in our last issue was by Messrs. Elliot & Fry.

SIR JOHN AIRD.

WE regret to announce the death, on January 6, at his country residence, Wilton Park, Beaconsfield, of Sir John Aird, Bart., aged seventy-seven years. Sir John Aird was the son of John Aird, contractor, who, when he came first to London from his native town, Fortrose, Ross-shire, worked as a stone-mason at Bromley, E., and afterwards won the contract for a water supply in Berlin. Sir John Aird represented North Paddington in Parliament in 1887-1905; he was elected Mayor of Paddington in 1900, and again in 1901; he was elected an Associate of the Institution of Civil Engineers in 1859; he became a member of the Iron and Steel Institute in 1887, and in 1886



[Photo, J. Russell & Sons.

The Late Sir John Aird.

was appointed to the Royal Commission upon the Depression of Trade. Sir John Aird was associated with his father in the drainage system for London, and, with Fox and Henderson, in the building of the Great Exhibition, 1851. The firm contracted for waterworks in Simla and Calcutta (with Brassey & Wythes), and at Staines, Hampton, Copenhagen, Amsterdam, Altona, and Berlin, and for gasworks at Beckton, Moscow, Bahia, Copenhagen and Para. In conjunction with Lucas Brothers, the firm of Lucas & Aird (since John Aird & Sons) were employed upon the construction of docks at Southampton, Tilbury, and Singapore. Messrs. John Aird & Sons were the contractors for the Manchester Ship Canal, the Royal Albert Docks on the Thames, the Royal Edward Docks, having a water area of 30 acres, at Avonmouth, Bristol, opened on July 9, 1908; the graving docks, on a site of 16 acres, on the Tees at Middlesbrough, and the docks at Newcastle-on-Tyne, begun in 1907; for the Friston works, 1897, of the Eastbourne Waterworks Company, and the waterworks, 1907, at Ninfield, Sussex; in May last they entered into a contract of 312,779*l.* with the Metropolitan Water Board for a reservoir and filter beds at Kempton Park. The firm were contractors for work upon the Hull and Barnsley Docks and Railway, and the West Highland, and District (St. John's Wood) Railways. The firm were appointed contractors for the Assouan Dam, 2,000 metres long, at the First Cataract, with the Assiout barrage, after designs by Sir William Willcocks, K.C.M.G. In February, 1898, they agreed with the Egyptian Government to complete the works in five years, and to then receive 2,000,000*l.* The work was finished in 1902. They next undertook the raising of the dam, a barrage at Esneh, and ancillary works, for a further expenditure of more than 3,000,000*l.* Sir John Aird, we may add, was the inventor of the "steam navvy."

Sir John Aird collected many works by modern artists, comprising Romney's "Lady Hamilton as the Comic Muse," Sir L. Alma-Tadema's "Heliogabalus, and the Banquet of Roses," Lord Leighton's "The Arab Hall," Fred Walker's "The Introduction," D. G. Rossetti's "Dante," and examples of Calderon, Pettie, Frith, Stanfield, Macbeth, Cattermole, Prinsep, Faed, H. S. Marks, Marcus Stone, F. Dicksee, Sir Luke Fildes, and others. Sir John Aird married a daughter of Mr. Benjamin Smith, of Lewisham, who died in 1909; his elder son John, born in 1861, succeeds to the baronetcy conferred upon him in 1901. The interment took place on Wednesday at St. Anne's Church, Dropmore.

ARBITRATION IN CONTRACTS.

At the monthly meeting of the Liverpool City Council, which took place at the Town Hall on the 4th inst., Colonel Kyffin-Taylor, M.P., submitted an opposed recommendation of the Housing Committee in favour of the appointment of a special committee, consisting of the Chairman and Deputy-Chairman of all the Standing Committees, to consider and report on the arbitration clause in Corporation contracts, with authority to receive deputations and obtain evidence. The Housing Committee, he said, were of the opinion that the Master Builders' Federation were entitled to be heard in this matter. The proposal which the Federation wished to submit was one which would affect the arbitration clause in all Corporation contracts.

Colonel R. S. Porter proposed as an amendment that the Finance Committee should be requested to consider the subject and receive the suggested deputations.

Alderman Cohen, Deputy-Chairman of the Finance Committee, seconded the amendment. At present, he said, the arbitration was solely in the hands of the City Surveyor. This system had been going on for many years, and he was not aware that any injustice had ever been done.

Mr. Sexton was strongly opposed to the subject being entrusted to the Finance Committee. That Committee had too much power already.

Mr. Harmood Banner (Chairman of the Finance Committee) asked why they should be expected to follow a course different from that pursued by all the large contracting companies in the kingdom. It had been for a long time the custom of all Corporations to make their officials arbitrators in all the contracts they made. The system, he confessed, seemed an unjust one, but the remedy lay with the contractors and not with the Corporation. The present system was devised to protect the interests of the Corpoation, and if the contractors did not like it they should protest and refuse to enter into any contracts which contained the objectionable clause. If a united protest of that kind were made it would be effective.

Mr. Herbert Rathbone said that a report from a special committee was desirable, because the members of the Council needed information before they could make up their minds on the question. It was desirable that they should know whether the existence of the arbitration clause had led any contractors to refrain from tendering for Corporation work. He had been assured by a member of the City Council that at least one important contractor had refused to tender on account of the clause.

Alderman Salvidge said it was in accordance with the standing orders that critical questions of emergency should be referred to the Finance Committee.

Alderman Brownbill said that originally he had been opposed to the arbitration clause, but after many years' experience of its satisfactory working he approved of it.

The amendment was defeated by forty-nine votes to thirty-eight, and the Housing Committee's motion was adopted.

PREVENTION OF CORRUPTION ACT.

We have heard from the Secretary of the Secret Commissions and Bribery Prevention League, Incorporated, 3, Oxford-court, Cannon-street, London, E.C., in reference to our article last week on the "Purchase of Employment in the Building Trade." He writes:—"If the leading members of the building trade were to join the League it would strengthen hands all round, lightening the task of honest men, and making that of dishonest traders more difficult. I shall be pleased to send particulars of the League to any applicant."

SAVING CEMENT FROM EMPTY BAGS.

According to the results of an experiment recently made of the Aberthaw Construction Company, of Boston, U.S.A., a considerable saving can be made by shaking empty cement bags and collecting the material in a box for use. The number of bags treated was 7,598, and these yielded 4,130 lb. of cement, which tensile strength tests showed to be equivalent to 2,664 lb. of pure cement from the same consignments. In addition to the value of the cement, a saving of 41s. 3d. was effected in return freight owing to the reduced weight of the empty bags, the net saving being shown by the subjoined account.

Account Showing the Saving Effected by Recovering Cement from 7,598 Empty Bags.

Dr.	£	s.	d.	Cr.	£	s.	d.
To cost of shaking bags and collecting cement	1	10	0	By cement recovered 4,130 lb. = 2,664 lb. of pure cement, at 33s. per ton	1	19	6
To net saving	2	10	9	By saving of return freight on 4,130 lb., at 22s. 6d. per ton	2	1	3
	£4	0	9		£4	0	9

THE WOOD TRADE.

MESSRS. FOY, MORGAN, & Co., in their Annual Wood Report, 1910, state that the importation of sawn and planed wood-goods into the United Kingdom during 1910, although noticeably larger than in 1908 or 1909, shows only a fractional increase in volume when compared with the average of the previous five years. The increase in average cost has, however, been considerable, and discloses on a similar basis of comparison an advance of upwards of 5 per cent. The figures are the more remarkable seeing that there has been, during the same years, an equally striking diminution in the consumption of wood. During the previous four years especially, this persistent decline in consumption proved an intolerable handicap to successful business, inasmuch as the reduction in supplies, although considerable, was at no time commenurate with it, so that, speaking broadly, the supply remained more or less in excess of the demand during this period. A year ago, however, it was possible to state that the limit of the drop in consumption had been reached. Since that time a process of gradual recovery has manifested itself, although perhaps not to the extent which the boom in the general trade returns might have foreshadowed, but sufficient, at all events, to justify the increase in stocks which has resulted from the greater volume of the import during the past season. It is always hazardous to make statements as to the relation of supply and demand at any moment, but after comparison of such statistics as are available, it seems safe to point out that the latest returns indicate that import and consumption are now more nearly in equilibrium than they have been since 1905. Compared, for instance, with 1909, while the import has been augmented by barely 5 per cent., the increase in consumption has been approximately 10 per cent., thereby helping to restore the balance, and probably indicating the restoration of more stable conditions of trade in the near future. While the import for the past year has in quantity only slightly exceeded the average, the actual increases on 1909 and 1908, when the depression in trade was at its deepest point, amounted to no less than 82,000 standards, and 150,000 standards respectively. The most remarkable point, however, is that had it not been for the rapidity with which the production of Russian goods has developed within recent years, this increase in the proportion of the wood supplies needed to satisfy the requirements of the United Kingdom could not have been forthcoming except at a still greater cost than has in fact occurred. This, perhaps, is beyond question, but is brought into prominence now that it is evident that practically the whole of the additional 150,000 standards, which represent the expansion of supplies during the last two years—that is since the import fell to its lowest point in 1908—has been obtained from Russian sources. As regards the sources of our supplies other than Russia, two considerations must be borne in mind; firstly, the diminished capacity for production owing to the gradual depletion of forests; secondly, the increasing demand within the producing countries, the annually greater requirements of established foreign markets, and the opening of quite new markets in the colonies and elsewhere. The last few years have shown considerable acceleration in the working of these hostile influences to the disadvantage of buyers here, and it is clear, therefore, that the former proportion of Scandinavian and American goods is not to be depended upon in future, while the extended use of Russian goods can alone furnish any effective barrier against an increase in cost which might well become burdensome. An easy freight market and the absence of labour troubles (which in the previous year proved such an embarrassment to Swedish shipments) have combined to facilitate shipping operations, and in consequence the season's supplies have come forward with regularity. The fact that the surplus import has been widely distributed among the various outports, instead of being concentrated in a few of the larger centres, can be taken as confirmation that the improvement in trade throughout the country is general rather than partial. The most conspicuous increase is in the case of the Irish ports, which have taken 25 per cent. more after absorbing a very considerable increase in the preceding year, a revival which has no parallel in any other part of the kingdom. The result of last year's trading, after allowing for the occasional grumbling caused by severe competition, has probably been more remunerative to the trade at large than for a long time past. The previous year, judged by the standard of the series of disastrous seasons which had preceded, was not entirely unsatisfactory, but then profits were rendered possible mainly because the delay in getting supplies enabled old stock to be worked off in spite of a slack demand. The results of 1910, even though the margin of net profit may not be much greater, are more satisfactory and more promising for future business, inasmuch as they are the outcome of an improvement in consumption draining off increased supplies at a higher cost. The improvement in trade meanwhile is everywhere apparent, especially in its manufacturing and export branches, and even the building trade, so far as can be judged by the official statistics of employment, would seem to be at last emerging from the long-continued depression. The Report contains detailed information relating to the trade during the past year, and with it is issued several interesting wood-market diagrams, showing the periodical estimates of the duration of supply, in comparison with the averages of the same, at the same time, in the previous five years. The figures are based on Messrs. Foy, Morgan, & Co.'s monthly circulars of London statistics.

Messrs. Churchill & Sim, in their "Wood Circular," give the Board of Trade figures of the importation of wood into the United Kingdom during 1910, showing "a slight increase again on those of the three previous years. This increase in quantity has been accompanied by steady market prices throughout the year, at a level leaving foreign and colonial shippers little to complain of, and there is no evidence of any accumulation of stock in this country. It follows, therefore, that the consumption of the year must at least have kept pace with the increase in the supplies, and at last taken that turn for the better which has been awaited so long and so anxiously. It is on this improvement in consumption likely now, judging by all previous experience, to be maintained for a series of years, that the hopes for 1911 are based. It is a good foundation to build upon, and one which justifies the unusually large amount of buying which has already taken place for the new season. There has been no great increase in the rates asked by shippers, these gentlemen wisely preferring to consolidate a steady market all round, rather than to extract high prices from a few sanguine buyers here and there. It has been possible, however, to obtain a definite increase for the larger sizes, and even at this increase these sizes still prove the most attractive portion of the stock notes. The first sign in the extremely gradual process of the deterioration of a forest is to be found in a growing scarcity of large trees. The small trees can be found and transported more easily and replaced more quickly. How long it may be before the world's demand for wood proves too great for the European forests and requires to be supplemented by other supplies in more distant countries it is impossible to say. It will not be yet; but there has been some hint in 1910 that for these large sizes the quantity available has rather fallen short than otherwise, and this in a season when the extent of the demand has been less than an average, and when they have been saleable at prices sufficiently high to encourage production. For foreign shippers the year has been one of much encouragement. From the White Sea the export has not been a large one, and it has been very easily saleable. From St. Petersburg the quantities of wood available for shipment tend to expand year by year as more and more capital is invested in forests and saw-mills. The demand has, however, fairly kept pace with the supply. From Sweden the year's production has been a considerable one, more especially of prepared boards, and has not been interfered with by any cause, such as the labour troubles of 1909. Prices have, nevertheless, been unusually steady throughout the season, and in the end the total supply has been exhaustively dealt with, and buyers are more willing to contract ahead again for 1911 than they were at this time last year, and at a more liberal range of price." The Report contains much detailed information relating to the past year in the trade.

GENERAL BUILDING NEWS.

CHURCH, PORTOBELLO.

A new building is being erected for the congregation of St. James's Parish Church at Portobello. It consists of nave, apse, transepts, gallery at one end, vestry, and a suite of halls, and will contain 850 sittings. The plans are by Mr. G. M. Watson, architect, Edinburgh.

SCHOOL FOR THE BLIND, SOUTHMEAD, BRISTOL.

The Bristol School of Industry for the Blind now occupy new premises at Southmead. The buildings provide accommodation for 110 pupils. Red brick and freestone dressings have been used in the structure, which was designed by Mr. E. Gabriel, of London. The work has been carried out by Messrs. R. Wilkins & Sons, of Bristol, Mr. J. Warlow being the clerk of works.

SCHOOL, DUNDEE.

The new building erected in Dens-road by Dundee School Board has been opened. Built from plans prepared by Mr. Langlands, the Architect of the Board, the school has been erected in eighteen months.

PAROCHIAL HALL, NEWCASTLE.

The two adjacent blocks of new parochial buildings, adjoining St. Mark's Church and Vicarage, Newcastle, have been opened. The architect of the last two new buildings is Mr. A. B. Plummer, F.R.I.B.A., of Newcastle. The contractors are Messrs. Middlemiss Bros., of Newcastle. The contractors have been assisted by the following sub-contractors:—Messrs. Merrilees & Denton, of Gateshead, painting and glazing; Messrs. Henry Walker & Son, of Newcastle, heating, etc.; Messrs. Allinson & Son, of Gateshead, plumbing; Messrs. Falconar & Cross, of Newcastle, electric lighting; Mr. Hewitson, Newcastle, slating; Mr. McIntyre, Gosforth, plastering; North of England School Furnishing Company, sliding partitions, etc.

TERRITORIAL DRILL-HALL, CRUMLIN.

The new hall is erected on a suitable site at the top end of the football ground, and near the Great Western Railway. The various dimensions of the rooms are:—Hall, 60 ft. by 30 ft.; officers' room, 15 ft. by 15 ft.; orderly, 20 ft. by 15 ft.; sergeants' room, 15 ft. by 15 ft.; lecture-room, 20 ft. by 15 ft.; stores, 18 ft. by 18 ft. Alongside is a house for the instructor. The design is neat, and of a character to show the purpose of the building. The panel over the doorway has the figure of a dragon carved on it. There is sufficient space left at the rear for open-air drills. The work has been carried out by Messrs. Gregory Brothers, Pontnewydd, under the superintendence of the architect, Lieutenant A. J. Bowen, Crumlin.

SKATING PAVILION, WEYMOUTH.

A new pier skating pavilion has been opened at Weymouth. The work of erecting this annexe to the Pavilion Theatre has been carried out under the supervision of the pavilion architects, Messrs. Mangnall & Littlewoods, of Manchester. The skating area is about 530 sq. yds., and it has a double wood floor, the upper surface being in maple wood in narrow widths, lined with felt between the two thicknesses of boards. There is a balcony communication all round the roof, which connects with the pavilion balcony, affording accommodation for 500 people, and two glass folding partitions, which open upon the asphalt rink outside. Three parts of the roof are covered with wire-woven patent glazing.

ROYAL SOCIETY OF MEDICINE: NEW PREMISES.

Messrs. John Belcher, R.A., & J. J. Joass are the architects of the buildings which the Royal Society of Medicine have begun to erect in Henrietta-street, W., with a return frontage to Wimpole-street (south end).

ITALIAN HOSPITAL, QUEEN-SQUARE, W.C.

The Italian Ambassador formally opened the new extension at this hospital on Saturday last. The new wing, occupying a site in Devonshire-street, was designed by Mr. J. D. Slater, of John-street, Bedford-row, and the contractors were Messrs. E. A. Roome & Co., of Basinghall-street, E.C., and Homerton. The basement contains the laundry, mortuary, post-mortem room, etc., and the ground floor provides the out-patients' department, pharmacy, and ophthalmic department. The new isolation ward and nurses' quarters are found on the first floor. The second floor provides the new operating theatre, sterilising room, anæsthetising room, and surgeons' quarters, while the third floor is devoted to the servants' quarters.

THE CARNEGIE LIBRARY, CLONDALKIN, IRELAND.

The Carnegie Library at Clondalkin has been opened. The buildings consist of two stories. On the ground floor are the library and reading-rooms. The first floor is devoted to an assembly hall, capable of holding between three and four hundred persons. Mr. T. J. Byrne was the architect.

STIRLING BUILDING TRADES.

In Stirling, as in other places, the building trades during the past year have been comparatively slack. The new land taxes have had their effect on the property market, and intending builders are inclined to wait and watch the ultimate effect of those taxes. As an indication of the state of the building trades in Stirling during the past year, it may be stated that the Town Council dealt with sixty-six applications for new buildings or alterations or additions to existing buildings.

the majority of the applications going under the latter two headings.

VILLAGE HALL, LETHERINGSETT.

A village hall, the gift of the Master of the Rolls (Sir Herbert Cozens-Hardy), has been built at Letheringsett to plans prepared by Mr. E. T. Boardman, of Norwich. The work of construction has been carried out by Mr. W. H. Tuthill, of Holt.

SOCIAL CLUB, NEWBIGGIN.

The building known as the "Bank House," Newbiggin, has been opened for club purposes by the members of the Newbiggin, North Seaton, and District Social Club. The alterations have been carried out by Mr. F. J. Hepple, contractor, Newcastle, from the plans of Mr. F. C. Murphy, architect, Morpeth.

MASONIC TEMPLE, ABERDEEN.

A Masonic Temple has been erected in Crown-street for the Aberdeen City Province. The estimated cost of the building was about 10,000*l*. The contractors were:—Mason, Mr. Edgar Gauld; carpenter, Mr. George Jamieson; slater, Mr. George Farquhar; plumber, Mr. David Ogilvie; plasterer, Messrs. Roger & Baxter; marble and tiles, Messrs. James Bannochie & Sons; steel work, Mr. George Bisset; joiner work and furnishings, Messrs. J. & A. Ogilvie; inside painter work, Mr. John Whyte; outside painter work and glazing, Mr. Edward Copland; electricians, Messrs. Claud Hamilton, Ltd.; asphalt, Messrs. W. Briggs & Sons, Ltd., Dundee; heating, Messrs. James Cormack & Sons, Glasgow. The architect was Mr. Harbourne MacLennan, Aberdeen.

TRADE NEWS.

Messrs. Pinchin, Johnson, & Co., Ltd., varnish, colour, and paint manufacturers, Minerva House, 26 and 27, Bevis Marks, London, E.C., have issued a diary for 1911. They will send a copy upon request from any *bonâ-fide* builder of decorator, providing a trade card is enclosed.

A large clock has just been fixed at Ashingdon Church, Essex, as a King Edward VII. memorial. The work has been carried out by Messrs. John Smith & Son, Midland Clock Works, Derby, who have also lately restored and refixed the large clock and chimes in the new tower of Ilkeston Parish Church.

Bell's United Asbestos Company, Ltd., as the manufacturers of Poilite asbestos cement tiles in Great Britain, have in hand various contracts for roofing:—(1) Generating station at Scunthorpe, Doncaster, for Messrs. John Lysaght, Ltd., of Newport, Mon, and Doncaster; (2) generating works for Siemens Dynamo Works Company, Ltd., Stafford; (3) the West Gorton Chemical Works, Manchester; (4) various sheds for the Great Western Railway Company at Swindon; (5) the works of the Dulais Tinplate Company, Ltd., Pontardulais, South Wales; (6) sheds for Messrs. Richard Thomas & Co., Ltd, Llanelly.

In our issue of the 31st ult., in the notice of the Red House, Cromer, we omitted to mention that the stables were equipped by the St. Pancras Iron Work Company, Ltd., London, N.W. The stables contain six stalls, two loose boxes, and the St. Pancras patented system of paving.

The infants' school at Billingshurst is being warmed and ventilated by means of D. O. Boyd's Hygiastic ventilating school grates, made by Messrs. O'Brien, Thomas, & Co., Upper Thames-street, London, E.C., and Excelsior Works, Rollins-street, Old Kent-road, S.E. The firm have also supplied these grates to the St. Paul's Cray Schools, Kent.

The Haslingden New Union Infirmary is being supplied with Shorland's single and double-fronted patent Manchester stoves, with descending smoke flues, and also with Shorland's patent Manchester grates, by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

Messrs. Robert M'Alpine & Sons, contractors, Glasgow, have secured the contract for the construction of a reservoir for the Corporation of Birkenhead. The reservoir will be what is known as a masonry dam, and the site is near Corwen, North Wales. The cost of the undertaking will be approximately 180,000*l*.

The Board of Guardians of the Gateshead Union, having decided to improve the arrangements for the escape of the inmates in case of fire, has just purchased a new fire-escape of Merryweathers' "Self-Supporting" pattern. It has three telescopic ladders, extending to a height of 40 ft., and it can stand entirely self-supported, with a man at the head of the ladders, without resting against a building and without the aid of props and poles. It can, therefore, be used as a water tower for directing a jet of water into the upper floors of a burning building.

Under the direction of Messrs. Worsfold & Haywood, architects, Dover, Boyle's latest patent "Air-Pump" ventilators have been applied to the Elvington Institute, Dover.

Messrs. E. A. Roome & Co., of 36, Basinghall-street, E.C., and Homerton, N.E., are carrying out alterations and additions to the "Clarence" public-house, Whitehall, under the superintendence of Mr. M. T. Saunders.

The Directors of the London County and Westminster Bank, Ltd., have declared a dividend of 10s. per share, being at the rate of 20 per cent. per annum, free of income tax, for the half-year ended December 31 last.

PROJECTED NEW BUILDINGS IN THE PROVINCES.*

BACTON (NORFOLK).—School; Mr. W. V. Bushell, Secretary, Education Committee, Norfolk County Council, Norwich.

Bedwellty (Mon).—Nursing home, etc.; Mr. H. J. C. Shepard, Clerk, Board of Guardians, Bedwellty.

Birmingham.—Theatre, Stratford-road; Mr. C. S. Smith, Hedges-buildings, Bull-street, Birmingham. Factory premises, Farm-street; Mr. A. T. Archer, architect, 13, Temple-street, Birmingham; Messrs. W. B. & F. T. Archer, builders, Handsworth, Birmingham. Lamp department buildings, Cambridge-street; Mr. H. Stilgoe, City Engineer, Birmingham; Mr. F. Swift, builder, Alcester-street, Birmingham.

Blyth.—School (8,000*l*.); Messrs. Robson & Twaddle, builders, Blyth.

Bo'ness (Linlithgowshire).—Post-office, corner of Kinneil-street and East Pier-street; Mr. Jas. Thomson, architect, East Pier-street, Bo'ness.

Bootle.—Reconstruction of northern wing of hospital for the Committee of the Borough Hospital.

Brighton.—School, Coombe-road (10,800*l*.); Mr. E. Hackforth, Secretary, Education Committee, Town Council.

Brough (E.R. Yorks).—Police-station and superintendent's house; Mr. A. Beaumont, Surveyor, E.R. Yorks, County Hall, Beverley.

Buddings Field.—Wards (1,200*l*.); Gloucester Board of Guardians.

Castle Cary.—Clubhouse for Constitutional Club; Messrs. H. W. Pollard & Son, builders, Bridgwater.

Cleckheaton (Yorks). — Electric power station at Exchange Mills for Messrs. Chas. Hirst & Sons, Ltd. Two shops and house, Howard Park; Messrs. Robinson & Crowther, builders, Whitcliffe-road, Cleckheaton. Addition, Albert Mills, Scholes, for the Scholes Albert Mills Company, Ltd.

Coppull.—Institute and club off German-lane for the Coppull Institute, Ltd.

Coventry.—Nurses' home (3,650*l*.); Mr. A. J. Lord, builder, Wolston, Coventry.

Cwmcelyn (Mon).—Forty-eight houses; Mr. W. J. Davies, Surveyor, Nantyglo and Blaina Urban District Council.

Dunfermline.—Extensions, savings bank (1,000*l*.); the Managers.

Edinburgh.—Proposed hostels for female student teachers; Edinburgh Provincial Committee for the Training of Teachers.

Freethorpe (Norfolk).—School (120 places); Mr. W. V. Bushell, Secretary, Education Committee, Norfolk County Council, Norwich.

Heanor.—Theatre, Red Lion-square, for the Midland Electric Theatres and Cinematograph Company.

Hempstead.—Extensions, school; Mr. J. L. Redfern, Borough Surveyor, Gillingham, Kent.

Kendal.—Proposed gymnasium, swimming bath, etc.; Governors, Kendal Grammar School.

Kingsbury.—County school; Mr. J. Willmott, architect, 6, Waterloo-street, Birmingham; Mr. T. Clifford, builder, Glascote, Tamworth.

Kingston (Halifax).—Church; Vicar, St. Hilda's Church, Halifax.

Leamington.—Theatre; Mr. A. G. Latham, architect, 63, Temple-row, Birmingham.

Linthorpe.—Parish hall and schools (4,000*l*.); Vicar, St. Barnabas Church, Linthorpe.

Little Walsingham (Norfolk).—School; Mr. W. V. Bushell, Secretary, Education Committee, Norfolk County Council, Norwich.

Llandudno.—Church, West Shore; Mr. R. T. Beckett, architect, Chester.

Lochfyne, N.B.—Mansion house; Mr. H. B. Callandar, Arkinglas, N.B.

Manchester.—Theatre; Messrs. Naylor & Sale, architects, Irongate, Derby.

Middlesbrough.—Adaptation of premises for bank and suite of offices for Lloyd's Bank, Ltd.

Mordington.—Alterations and additions, Mordington House; Messrs. Gray & Boyd, architects, Berwick.

New Buckenham (Norfolk).—Enlargement of school; Mr. W. V. Bushell, Secretary, Education Committee, Norfolk County Council, Norwich.

Newmarket.—Technical institute; Mr. S. J. Ennion, Secretary, Education Committee, Newmarket Urban District Council.

Norton Canes (Staffs).—School (300 places); Mr. G. Balfour, Secretary, Education Committee, Staffs County Council, Stafford.

Packmoor. — School (3,750*l*.); Mr. Paul Pemberton, builder, Tunstall.

Perth.—Block of houses, Edinburgh-road; Messrs. Brand & Sons, builders, Elibank-road, Perth.

Portsmouth. — School, Stubbington-avenue; Architect, care of Secretary, Education Committee, Town Council.

Ramsgate.—Reconstruction of St. George's Schools; Secretary, Ramsgate Education Committee.

Rickmansworth (Herts).—School (150 places); Mr. A. R. S. Halliday, Secretary, Education Committee, Herts County Council, Hertford.

Rotherham.—Plans have been passed for club premises off Rawmarsh-road for the Rotherham Corporation.

St. Albans.—Theatre, Chequer-street; Mr. H. Mence, architect, Market-place, St. Albans.

St. Asaph.—Cottage home for children; St. Asaph Board of Guardians.

Salford.—The following plans have been passed:—Reconstruction of premises, Moss-lane West, for the Manchester and Salford Equitable Co-operative Society, Ltd.; extension of works, Trafford Park, for the Rubber Regenerating Company, Ltd.; offices, etc., Trafford Wharf-road, for the British Oil and Cake Mills, Ltd.

Sheffield. — Messrs. Wellerman Bros., builders, 223, Attercliffe-road, Sheffield. The following plans have been passed:—Four houses, Wood View and Ibbotson roads, for Mr. Beatson; alterations, premises, Bessemer and Faraday roads, for Messrs. Jonas & Colver, Ltd.; eight houses, Chatfield-road, for Mr. M. J. Gleeson; additions and alterations, Weedon-street and Weirhead, for Messrs. W. Jessop & Sons, Ltd.; additions, premises, Leavygreave-road, Gell and Victoria streets, for Jessop Hospital Board; additions, premises, Brightside-lane, for Messrs. Vickers, Sons, & Maxim, Ltd.; six houses, Ditchingham and Earsham streets, for Mr. G. E. Phillips; twelve houses, Mount View-road, for Mr. W. Hall; addition, premises, Penistone-road, for Messrs. D. Doncaster & Sons, Ltd.; four houses, Newman-road, for Mr. G. E. Pye; alterations and additions, premises, Walker-street, for Messrs. J. Wigfull & Sons, Ltd.; fourteen houses, Skelwith-road, for Mr. B. Hollingsworth; thirteen houses, Banner Cross-road and Button Hill-lane, for Mr. W. Ramsay.

Smallthorne.—School; Mr. J. Hutchings, County Buildings, Stafford.

Southend-on-Sea. — Twenty-seven houses, Cumberland-avenue; Mr. W. Brand, builder, Southend-on-Sea.

Spondon.—School; Mr. G. Widdows, architect, St. Mary's Gate, Derby.

Stafford.—Drill-hall; Mr. C. G. Cowlishaw, architect, Stafford-street, Hanley.

Stoke-on-Trent. — Additions, St. Peter's-chambers; Borough Engineer, Stoke-on-Trent.

Sutton.—School, Green Lanes; Mr. W. H. Clarry, Engineer, Town Hall, Sutton Coldfield.

Tamworth.—Drill-hall; Mr. C. G. Cowlishaw, architect, Stafford-street, Hanley.

Torquay.—The following plans have been passed:—Three houses, St. Mary Church-road, for Mr. S. Pack; electric theatre, Lower Union-lane and Temperance-street, for the London and Provincial Theatre Company, Ltd.

Walmley.—School; Mr. W. H. Clarry, Engineer, Town Hall, Sutton Coldfield.

Walsall. — Council schools, Field-street, Bloxwich (8,100*l*.); Messrs. Ewen Harper & J. A. Harper, architects, care of Surveyor, Walsall Town Council. Plans have been passed for Messrs. M. Harvey & Co., Ltd., for an iron foundry, Windmill-street.

Wigan.—Scot-lane Council School; Messrs. A Bywater & Sons, builders, Pemberton Saw Mills, Pemberton, Wigan. The following plans have been passed:—Seven houses, Chatsworth-street, for Mrs. Elizabeth Sharrock; picturedrome, Wallgate, for the Wallgate Picture Palace Company.

Wolverhampton.—Salvation Army Hall, Cleveland-street; Mr. G. Carl, builder, Raby-street, Wolverhampton.

Worcester.—School, Cat's-hill; Mr. V. Rowe, architect, Foregate, Worcester.

* See also our list of Competitions, Contracts, etc., on another page.

THE SURVEYORS' INSTITUTION:

SOME NOTES ON HIGHWAY LAW AS AFFECTING PROPERTY OWNERS.

At an ordinary general meeting of the Surveyors' Institution on Monday Mr. E. H. Blake read a paper on Highway Law. In the course of his remarks he said :—

The highway is, in most cases, not restricted to the merely metalled part, but usually includes the unenclosed wastes, the space at the sides being necessary to afford the benefit of the air and sun to the surface of the road; but very conflicting decisions have been given on this point.

In the absence of proof to the contrary, the presumption is that the adjoining owner's property extends to the centre of the road, this presumption being adopted in the construction of conveyances in which land is described as bounded by a highway.

In London the highways repairable by the public are vested in the borough councils, but all vaults, arches, etc., under streets are to be repaired by owners or occupiers. Where the stones of the pavement formed the actual roof of a cellar, the local authority was held liable to reinstate when worn down by traffic. In provincial towns the Public Health Acts vest streets repairable by the public in the urban authority, who are given very complete powers of repair, reconstruction, raising, lowering, or other alterations.

The Highways Acts are badly in need of consolidation. It is unnecessary to go into the history of the old highway surveyors, districts, and boards. In England and Wales roads outside urban areas are divided into two classes, main and district.

In London the control is in the hands of the borough councils so far as existing streets are concerned, and in the hands of the London County Council as regards the laying-out of new streets.

In an important case the Court of Appeal held that where a local authority have, in good faith, refused to pass building plans on the ground that the erection of the houses would amount to laying-out a new street of insufficient width according to the by-laws, no action will lie for a mandamus to compel them to pass the plans.

Some local authorities have their own special Acts, but in general their powers in the provinces are obtained from the Public Health Act, 1875, which enables urban authorities to make by-laws as to width, level, and construction of new streets.

The Housing, Town Planning, etc., Act, 1909, gives further drastic powers to the local authorities on this matter of laying-out streets, but I do not propose to deal with this Act, as an admirable paper on it was read at this Institution a short time ago.

The Making up of Private Streets.

In the metropolis powers as to paving are vested in the borough councils, as the successors of the vestries. The Metropolis Management Act, 1855 (sect. 105), provides that if the owners of the majority of houses in a new street not paved to the satisfaction of the council be desirous of having such street paved, or if the council deem it necessary or expedient that it should be paved, the council shall pave the same, either partially or entirely, and keep it in repair, the expenses of paving to be paid by the owners of the houses.

In the provinces the procedure for making-up private streets is in some cases regulated by special local Acts, but, generally speaking, it is done under either the Public Health Act, 1875, or the Private Street Works Act, 1892. The test of liability under sect. 150 of the former is the benefit of access. There may be no access at the time, but if there is the possibility of access, then there is the liability. There have been numerous cases on this point, and a few notes may be of interest.

There are many essential points of difference in procedure under the Private Streets Works Act, 1892. The owners are given no option of doing the work themselves. All objections are dealt with before the work is executed, and should the owner fail to make written objection within one month he loses his right to object. The expenses need not necessarily be apportioned by frontage; that is to say, the authority can, by resolution, adopt a benefit-derived principle.

The Act is an adoptive one, and has been largely adopted by urban authorities. It can by order of the Local Government Board be adopted by a rural district council. The "benefit-derived" principle has not been largely adopted, probably because it generally leads to trouble. There are many reasons why from an owner's point of view it should be adopted. With flank frontages, in the case of a corner site, an owner can, not unreasonably, expect an abatement. Most authorities charge by frontage only and make none. Some allow 25 per cent. reduction on flank frontage. In one case I have met with up to 100 ft. flank frontages are charged at half rate, and the remaining amount on the full rate. One often finds cases of large works on back land, involving a considerable use of the street, with no more frontage than a gateway. Such a case could not unreasonably be charged on a higher scale than by mere frontage.

The Liability to Repair.

The liability to repair may be upon either the local authority or the private owner, the former being responsible if it has taken the highway over or otherwise been made liable by statute.

We may summarise the cases in which the liability to repair is upon the public at large :—

(1) Highways dedicated to the public before August 30, 1835;
(2) Those dedicated after 1835, under sect. 23 of the 1835 Act;
(3) Those taken over in return for their use under the Highways Act, 1862;
(4) Those set out under Enclosure Awards;
(5) Those taken over after private street works have been done;
(6) Those repairable under agreement with owners, under the Public Health Act, 1875, sects. 146 and 148;
(7) Those made by a local authority under an improvement scheme;
(8) Main roads taken over by county councils under the Highways and Locomotives Act, 1878, and the Local Government Act, 1888;
(9) District roads under the control of a rural district council under the Local Government Act, 1894.

The extent of the liability of county councils was practically settled by what is known as the Warminster case, in which it was held that the liability included footpaths, crossings, scavenging, etc., but not lighting.

Extraordinary Traffic.

Before leaving the question of repair, attention may be given to a point which is often of interest to the land agent. Extraordinary traffic, according to a judgment of Lord Justice Bowen, "is a carriage of articles over the road at either one or more times which is so exceptional in the quality or quantity of the articles carried, or in the mode or time of user of the road, as substantially to alter or increase the burden imposed by ordinary traffic on the road, and to cause damage and expense thereby, beyond what is common." The basis of all claims for expenses incurred in respect of extraordinary traffic is the Highways and Locomotives Act, 1878, sect. 23, as amended by the Locomotive Act, 1898. Roads should, of course, be suitable for the traffic of the district, and if such traffic is largely due to some prominent local industry such industry should not be crippled by claims of this kind.

Making and Improving Roads.

Any local authority can make or improve roads as part of an improvement scheme under the Housing Acts.

Under various previous Acts a local authority may purchase any premises for the purpose of widening or otherwise improving any street.

In a general paper of this kind the Development and Road Improvement Funds Act, 1909, cannot be given more than passing mention. The newly-constituted Road Board has power to make advances to county councils and other highway authorities in respect of the construction of new roads or the improvement of existing ones, and to itself construct and maintain any new roads which appear necessary. The Board can only proceed with the approval of the Treasury, and local authorities have opportunities of objecting to any new roads proposed by the Board. The improvement of roads means widening, cutting off corners, levelling, dust prevention, and any other work beyond ordinary repairs. The Board can acquire land for new roads, together with a depth of 220 yds. on either side so as to get the advantages of betterment and power over the connexion of side roads. Power is given to enable compulsory sale, if necessary, and restrictions are imposed as to the nature of the land which can be taken. The Board has already resolved that in making advances priority of consideration shall be given proposals for dealing with curves, corners, and cross roads in dangerous places, and for dealing with narrow roads which have no footpaths.

Diversion, Stopping-up, or Abolition of Highways.

A public highway cannot cease to be such except by Act of Parliament or order of Quarter Sessions. Even if disused and overgrown, proof of public rights will enable an order to be obtained for clearing and re-opening it.

The Highways Act of 1835, as amended, provides that if a highway is to be stopped up or diverted it shall be viewed by two justices after certain formalities, who may issue a certificate giving reasons why the proposal should be acceded to. Any person aggrieved by the proposal may appeal to the Sessions, and the matter will be settled by a jury.

The Housing, Town Planning, etc., Act, 1909, provides that the Local Government Board may prescribe a general code of provisions for town planning schemes, such provisions including the stopping-up or diversion of roads or other ways, amongst many other things.

Roadside Hedges and Ditches.

The Highways Act of 1835 compels the surveyor of highways to maintain a clear width of 20 ft. where the space between the road fences will allow of this being done without infringing the rights of the adjoining owners. Where the latter have enclosed, the hedge and ditch belong to them absolutely, the public roadway only extending to the edge of the ditch. While dealing with hedges and ditches a few notes as to fences may be given. The Quarry (Fencing) Act, 1887, provides that dangerous excavations within 50 yds. of a highway or other open place dedicated to the public shall be properly fenced, or otherwise dealt with as a nuisance under the Public Health Acts. The Barbed Wire Act, 1893, provides that barbed wire adjoining a highway may be indicted as a nuisance.

Obstructions, Projections, and Encroachments.

Generally speaking, any person has a common-law right to remove obstructions to a highway, but must show his necessity for travelling over the part obstructed. There are, however, certain legal obstructions. Thus the Highways Act, 1835, made it the duty of the authority to provide direction posts, and the General Turnpike Act, 1822, empowered turnpike trustees to erect milestones, this power being extended to local authorities by the Highway Rate Assessment and Expenditure Act, 1882.

The Motor-Car Act, 1903, legalises the erection of danger signs. The Public Health Acts in the provinces and the Metropolis Management Acts in London make it necessary to erect hoardings, with platforms, handrails, etc., as may be required where building works are going on adjoining footways. This is done in London by written licence from the local authority.

The Telegraph Acts empower the erection of poles on highways with the consent of the local authority. In some cases telephone companies get similar powers under licence from the Postmaster-General under the Telegraph Acts. Poles erected without statutory powers are a nuisance and indictable.

The Towns Police Act, 1847, requires the projecting blinds and awnings of shops to be not less than 8 ft. from the ground. The Towns Improvement Act, 1847, deals with projections into streets, enacting that anything which is an obstruction to the safe and convenient passage along any street, whether over head or under foot, may be ordered by the local authority to be removed. The

Metropolis Management Act, 1855, provides that if projections existing before the commencement of the Act are an annoyance, or dangerous to traffic, they may be removed or altered by the local authority, who must pay compensation for any damage sustained. In the case of such obstructions formed after the Act the owner may be given fourteen days' notice to remove or alter them at his own expense.

An urban district council has power to remove encroachments on any highway vested in it without first taking proceedings against the offender.

THE NOTTINGHAM ARCHITECTURAL SOCIETY:

TOWN PLANNING.

A MEETING of this Society was held at 64, St. James's-street on the 3rd inst., when the President, Mr. Robt. Evans, jun., F.R.I.B.A., presided. The subject of the paper was "Notes on the Town Planning Act, 1909, from an Architect's Point of View," by Mr. E. R. Sutton, F.R.I.B.A., the Vice-president, who has obtained the loan of several town planning schemes.

Invitations had been sent to the Nottingham City Council and the Surveyors of the local district councils, and a number of these gentlemen showed their interest by being present.

After giving a detailed description of the plans of Hampstead Garden Suburb, Bournville, and Letchworth, Mr. Sutton dealt with the Town Planning Act of 1909. In the course of his subsequent remarks he said:—

The author of the Bill is, of course, the President of the Local Government Board, Mr. John Burns. The "Housing and Town Planning Act" amends the law relating to the housing of the working classes, and also provides for the making of town planning schemes.

In Part I. there are fifty-three sections, a number of which are complicated owing to the fact that they are what is known as "legislation by reference to other acts." There are, however, some provisions in this part of the Act which may be useful to the architect. The first seven sections deal with acquisition of land, loans to local authorities, payments, etc.

Sect. 4. The "Public Works Loan Commissioners" are authorised to lend to a "Public utility society" up to two-thirds of the value of the property in place of one moiety, as previously.

A "public utility society" is defined as a society registered under the "Industrial and Provident Societies Act, 1893." The rules prohibit the payment of any interest at a rate exceeding 5 per cent.

Sect. 6 provides for the local authority contributing towards the cost of laying out and constructing any street or road on the condition that those streets or roads are dedicated to the public.

Sect. 8 provides for the local authority accepting a donation of land or money, or other property for any of the purposes of the Housing Acts, and it is not necessary to enrol any assurance under the "Mortmain and Charitable Users Act, 1888."

Sect. 14 provides that "In any contract for letting a house the rent of which does not exceed in London 40*l*., in a borough or urban district (having a population of 50,000 or upwards) 26*l*., houses situate elsewhere, 16*l*.," there shall be implied a condition that the house is at the commencement of the holding "reasonably fit for human habitation." Under the 1890 Act the limit was—London, 20*l*.; Liverpool, 13*l*.; Manchester and Birmingham, 10*l*.; elsewhere, 8*l*.

Importance to Surveyors.

Sect. 17 is an important one from the Surveyors' point of view. Under this clause it is the duty of every local authority to make from time to time an inspection with a view to ascertaining whether any dwelling-house in their district is in a state dangerous or injurious to health. If any house is found in such a state an order prohibiting its use for habitation shall be made, until it is rendered fit.

If the local authority are satisfied that the house has been rendered fit for human habitation they may determine the order.

If, on the application of the owner, the local authority refuse to determine a closing order, the owner may appeal to the Local Government Board by giving notice within fourteen days after the application is refused.

In sub-sect. 7 a room habitually used as a sleeping place, the floor of which is more than 3 ft. below the street level, shall for the purposes of this section be considered so dangerous or injurious to health as to be unfit for human habitation, if the room is not on an average 7 ft. high. If, however, a closing order is made in respect of such room it shall not prevent the room being used for purposes other than those of a sleeping place.

Sect. 18. When a closing order has remained operative for three months, the local authority shall take into consideration the question of demolition, and shall give the owner notice of the time and place at which the question will be considered. The owner is entitled to be heard. After being heard, the owner, if aggrieved, can appeal to the Local Government Board.

The sections which concern us most as architects are 22, 26, and 27.

Sect. 22 deals with "unhealthy areas." The amendment reads, "that the most satisfactory method of dealing with the evils connected with such houses, courts, or alleys, and the sanitary defects in such area is an improvement scheme," are substituted for "that the evils connected with such houses, courts or alleys, and the sanitary defects in such area *cannot be effectually remedied otherwise* than by means of an improvement scheme."

Sect. 26 provides for the inspection of "unhealthy areas." Under sect. 5 of the principal Act, any twelve ratepayers may complain to the Medical Officer of Health of the unhealthiness of an area. Thereupon it is his duty to inspect. Should the twelve ratepayers be dissatisfied with the report they may now appeal to the Local Government Board, and on security for costs being given, a qualified medical practitioner must be appointed to report.

Apparently the Local Government Board could not before this appoint one of their own officials to make the inspection and report.

Sect. 27 is an amendment as to right of easements. The principal Act provided "that all rights of way and easements shall be extinguished upon purchase of land for a reconstruction scheme."

Back-to-Back Houses.

Sect. 43 is interesting. It reads: "It shall not be lawful to erect any back-to-back houses intended to be used as dwellings for the working classes," but provides for certain exceptions as in the case of houses containing several tenements where the Medical Officer of Health certifies that effective ventilation is secured.

Part II. of the Act is of a permissive nature. The general provisions are intended to promote co-operation between local authorities and land owners, and to remove difficulties in the shape of conflicting by-laws, which prevent local authorities from acting jointly in a comprehensive scheme.

Sect. 54 provides for the inclusion in a Town Planning Scheme of any neighbouring lands. Before, however, any of the local authorities are justified in preparing a scheme with reference to "any land within the neighbourhood of their area" they must satisfy the Local Government Board that there is a *prima facie* case for making such a scheme. Any local authority may be authorised by the Local Government Board to adopt with or without modification any such scheme proposed by all or any of the owners of the land comprised therein.

The scheme may include any land likely to be used for building purposes, for providing open spaces, roads, streets, parks, pleasure or recreation grounds, or for the purpose of executing any work incidental thereto. It may also include land already built upon, or that is not likely to be used for building purposes, if it appears to the Local Government Board that such land should be included, and provision may be made for demolishing or altering any building thereon so far as may be necessary for carrying the scheme into effect.

What land may or may not be included rests in the first instance upon the decision of the Local Government Board, but if an objection be presented, a public inquiry must be held in the locality before the matter can be settled.

A proposed scheme may be varied, or a subsequent one may be substituted, if the Local Government Board should think fit, or the scheme may be revoked entirely. In any case, it does not become operative until it has been formally approved by the Board. If objection is made to it, it does not become valid until it has been confirmed by Parliament.

Sect. 55. In any scheme containing provisions for suspending any statutory enactment, by-laws, or regulations—say in order to relieve the promoters of unnecessary expenditure on road construction or other works—such scheme does not come into force until a draft has been submitted by the Board for the approval of Parliament.

When the land proposed to be acquired is situate in London or borough or urban district, the Board must appoint an impartial person, not in the employment of any Government department, to hold a public inquiry, and to report whether the land proposed to be acquired is suitable and without detriment to the persons interested or the owners of adjoining land. If after receiving the report, the Board confirm the order, otherwise than subject to the recommendations contained in the report, their order is rendered a provisional order, and does not have effect unless confirmed by Parliament.

Procedure in Town Planning Schemes.

Sect. 56. The Local Government Board may make regulations as to the mode of procedure to be adopted with respect to applications for authority to prepare or adopt a town planning scheme. These regulations were published on May 3, 1910, and the following is a short summary:—

First of all the local authority must give two months' notice to all owners and occupiers of land likely to be affected, and advertise their intention to apply for permission to prepare a scheme. They must deposit for inspection a map on the 25-inch ordnance scale of the land proposed to be included, and arrange to give any necessary explanation.

The local authority, before making an application for permission to prepare a scheme shall consider any objection made *to them* in writing by the owners or other persons interested in the land included.

The local authority should arrange for at least one conference with owners or other persons interested. They are further required to arrange for at least one meeting. Notice (not less than fourteen days) of such meeting is to be served on all owners.

A copy of all objections must be forwarded by the local authority to the Local Government Board as part of the information required when permission to prepare a scheme is applied for.

If the Local Government Board give authority for the scheme to be prepared, notice must be served again on the owners of land included.

When the local authority have fully decided on the scheme, a draft has to be printed, further maps and particulars prepared and deposited for inspection for twenty-one days. The local authority must again serve notice on the owners, and a public meeting must be held, as prescribed for the first stage of the proceedings.

If the Local Government Board approve the scheme, notice must be published in the local newspaper, and must also be given to the several owners. Any interested person objecting to it must make his objection in writing to *the Local Government Board*, not the local authority this time.

Sect. 58 provides "that any person whose property is injuriously affected by the operation of a town planning scheme is to be compensated if he makes a claim within the time limited (which must not be less than three months after notice of approval of the scheme is published), but where the scheme increases the value of the property the owner is liable to pay to the authority one half the amount of such increased value. Any question as to whether the property is injuriously affected or increased in value, and as to the amount to be paid as compensation either to the landowner or from the landowner to the authority responsible, is to be determined by a single arbitrator appointed by the Local Government Board unless the parties agree on some other method of determination."

Sect. 59 provides for the insertion in any town planning scheme of the height and character of, as well as the space about, buildings to be erected, and the number of such buildings.

Purchase of Property.

Sect. 60 provides for the purchase of any land in the scheme by agreement or compulsorily. The basis of value is left in entirely open

matter, and no allowance is to be made on account of the purchase being compulsory. This appears to clash with the rights of ownership as generally understood. It seems rather a one-sided arrangement to compel an owner to sell his land without making him some allowance beyond the ordinary selling value to an outsider, and to accept a price that is fixed by an arbitrator of the Local Government Board.

This finishes my notes on the Act itself, but I would here remind you that in Nottingham a start in "housing reform" has already been made, and Dr. Milner, the chairman of the Nottingham Housing Committee, in a recent address, pointed out that there were three main principles in this reform: (1) Ending or mending existing insanitary property; (2) prevention of similar evils, and (3) maintenance of improvements effected.

The Housing Committee proceeded under the second part of the Act, which enabled them to improve individual houses at the expense of the owner, not the ratepayer. After the first year's work 347 houses were dealt with at a cost of 226*l*. 14s. 6d. to the Corporation, including administration expenses.

At present the Committee had a large number of houses scheduled, and the work was increasing to a very large extent.

The great desire of the Committee was to work amicably with the owners of property, and so far there had been no difficulty in the matter. Nevertheless they were determined to enforce their demands.

With a view of realising how necessary it is to have an Act like the Town Planning Act so that the land may be laid out to the best advantage, I have obtained the following particulars:—

The population of England and Wales between 1891 and 1901 increased at the rate of 12.2 per cent., and in 1901 was 32¼ millions.

Between 1891 and 1901 as much as 576,000 acres of land was transferred from rural to urban districts, and the quantity of land withdrawn from cultivation during that period was nearly 484,000 acres, which latter area increased between 1891 and 1907 to 624,000 acres. These figures indicate that the quantity of land withdrawn from cultivation between 1891 and 1907 was nearly 42,000 acres per annum, or nearly four times the area of the City of Nottingham.

The population of England and Wales is increasing at the rate of nearly 400,000 a year, and the average annual area of land withdrawn from cultivation would thus be rather over 100 acres per 1,000 of increased population.

The following figures show how greatly the density of the population has increased during the last century:—

In 1801 there were 152 persons her square mile, or 4·20 acres per person. In 1851 there were 307 persons per square mile, or 2·08 acres per person. In 1901 there were 558 persons per square mile, or 1·15 acres per person.

The average number of persons in each inhabited house in England and Wales in 1901 was 5·19, in London 7·3, and in Bradford 4·1.

Under the modern methods of development adopted in different towns for housing the artisan classes the average number of persons to the acre varies from 44 to 65 per acre.

An interesting discussion upon the points mentioned in the paper followed, in which Messrs. W. Burn, E. B. Crossley, H. A. Dickman, T. W. Gordon, A. E. Heazell, C. Howitt, W. Smith, W. H. Taylor, and Dr. Wray took part.

After Mr. Sutton had replied to the discussion, Mr. Robt. Evans, jun., said: "I hope in future the authorities will take more interest in the extension and laying out of our towns and cities, and by looking ahead will seize the opportunities for improvement as they occur.

I am sure I am expressing your wishes when I propose that our very best thanks be given to Mr. Sutton for his trouble in preparing such an important paper, and for obtaining for our inspection the loan of so many typical town planning schemes. Our thanks are also due to Mr. A. E. Heazell, who has also obtained a lot of information on the subject."

Mr. A. Dale, in seconding the proposition, said: "Mr. Sutton has given us a great amount of information as to the working of the Act which will be very useful."

The vote of thanks received the hearty support of the meeting.

FOREIGN AND COLONIAL.

Custom House Wharf, Mexico.

H.M. Minister at Mexico City reports the publication of a contract between the Mexican Government and Mr. Charles Ernest Race for the construction of a Custom House wharf at the port of Ensenada, Lower California. The wharf is to be constructed of wood and masonry, and equipped with lights, mooring buoys, cranes, etc. Warehouses are also to be built, and connected with the wharf by rail or tram lines. Plans are to be submitted for approval within six months from December 5, and work is to be begun within nine months after their approval. Building material, machinery, etc., may be imported free of duty.

Building in San Diego, United States of America.

The *Bulletin Commercial* (Brussels) of December 31 notifies, on the authority of the Belgian Consul at San Francisco, that, owing to the rapid development of the town of San Diego, there is great activity in the building trade there, and consequently a large demand for reinforced concrete. About 750,000*l* was spent on building operations during 1910. Work will be begun shortly on three more large buildings, viz., a railway station, a theatre, and an hotel, the total cost of which is estimated at nearly 300,000*l*.

Theatre, Hayti.

H.M. Consul-General at Port-au-Prince (Mr. A. Murray) reports the publication of a contract between the Government of Hayti and MM. Occide Jeanty and Justin Elie, representing a group of capitalists, for the establishment at Port-au-Prince of a theatre with a seating capacity of 1,000. The building is to be of stone and reinforced concrete. All materials required may be imported free of duty.

Building in Costa Rica.

H.M. Consul at San José (Mr. F. N. Cox) reports the publication of a Congressional decree, which came into force in November last, imposing a tax on all persons leaving the Republic of Costa Rica, the proceeds of the tax to be devoted to the extension and improvement of the Customs House at Limon, to the repair of the wharf at Puntarenas, and to other Government buildings. The executive authorities are empowered to negotiate a loan of 150,000 colons (about 14,350*l*.), at a rate of interest not to exceed 12 per cent., on the security of this tax.

LONDON COUNCILS.

Battersea.—Messrs. Brookes, Ltd., have had a tender accepted for from 1,500 to 2,000 ft. run of Aberdeen granite kerbing at 2s. 1d. per foot run delivered on the works in Battersea Bridge-road. A scheme by the Borough Surveyor, providing for the erection of a chimney-shaft 110 ft. high at the baths, also economiser plant and hot-water storage tank, etc., at an estimated cost of 1,330*l*., has been approved.

Hackney.—Mr. Geo. Porter, 54, Millfields-road, Clapton, is to make up, kerb, etc., portion of Pigwell Path, the contract price being 386*l*. 12s. 2d. Messrs. Edmondsons, Ltd., have had plans passed for a building at Clapton Common. Mr. J. McManus has lodged plans for a corrugated iron church at St. Joseph's Hospice, Cambridge Lodge Villas, Mare-street.

Hendon.—The Urban District Council has accepted the tenders of the Atlas Stone Company, Ltd., Cliffe Hill Granite Company, Ltd., Empire Stone Company, Ltd., and the Thames Stone Company, Ltd., for the supply of artificial stone paving at 3s. 3d. per yard. The following plans have been passed:—Mr. H. A. Champ, four houses, Shakespeare-road; Mr. F. Bastable, motor garage, rear, 21, Hampstead-gardens, Finchley-road; Mr. W. A. Smyrk, forty houses, Sydney-grove; Messrs. E. Evans & Sons, five houses, Hamilton-road, Golder's Green; Mr. F. W. Bristowe, ten houses, Woodstock-avenue; Mr. A. Wilde, six houses, Bell-lane; Mr. D. Wynter, additions, Collindale Laundry; Mr. J. Gibb, jun., thirteen shops, The Promenade, Golder's Green; Mr. A. J. Archer, three pairs of houses, Hodford-road; Mr. E. Streather, eighteen houses in various roads; Second Hampstead Tenants, Ltd., twenty-six houses in various roads; Hampstead Tenants, Ltd., three cottages and additions to clubhouse. The Rural District Council have passed plans for Messrs. C. & E. Steeles for six houses, Cornwall-road, Pinner.

Islington.—Widdenham-road is to be made up and paved. Repairs are to be carried out in eight roads at an estimated cost of 1,896*l*.

Marylebone.—The Works Committee of the Borough Council have considered plans submitted by the Metropolitan Railway Company, dealing with their works of improvement at Baker-street Station. They propose to construct a bridge below Marylebone-road for the convenience of passengers entering the station on the north side and requiring to join "down" trains. The Committee have passed the plans, subject to the Borough Surveyor being satisfied as to the method in which the work will be carried out, and also subject to protective conditions in regard to the throwing into the public highway of the portion to be surrendered of the ground now occupied by the booking-offices.

Poplar. — The Works Committee has approved a list of repairs to paved roads and repaving works to be carried out during the ensuing year at an estimated cost of 8,900*l*.

Watford.—The Urban District Council have instructed their Surveyor to prepare plans, estimates, etc., for making up Whippendell-road, between Queen's-avenue and Hagden-lane. The following plans have been passed:—Messrs. Thomas Kesnor & Co., Ltd., factory, Whippendell-road; domestic economy centre, Higher Elementary School (old Grammar School), Derby-road; Winton Motor Agency, motor garage, Market-street; Counties' Electric Theatre, Ltd., electric theatre, High-street; Messrs. W. King & Sons, additions to laundry, Sydney-road; Mr. E. W. Jones, eight houses, Hagden-lane.

West Ham.—The Borough Engineer has prepared plans for the erection of slipper baths at an estimated cost of 1,285*l*. Application is to be made to the Local Government Board for a loan. The Borough Engineer is to prepare plans and estimates for an extension of the convenience at the Broadway, Stratford. An intimation has been received that Messrs. Price & Co., of Chaucer-road, are proposing to extend their factory premises. The following plans have been passed:—Messrs. J. T. Jarvis & Son, extensions to convent, Bethell-avenue, Plaistow; India-rubber and Gutta-percha Company, Ltd., extension to hose shop, Silvertown; Mr. I. Noakes, dining-hall, Messrs. C. Turner & Sons' premises, Bradfield-road, Silvertown; Anglo-American Oil Company, Ltd., addition to office, Bradfield-road, Silvertown; Venesta, Ltd., boiler-house and addition to tank-house and external iron staircase to D block, North Woolwich, Silvertown; Messrs. H. Tait & Sons, Ltd., alterations, Thames Sugar Refinery, Silvertown. The following plans have been lodged:—Mr. A. G. Chamberlain, adaptation of 5 and 6, Bridge-road, Stratford, for cinematograph theatre; Mr. A. R. Thornton, twenty houses, Connaught Garden Estate, Custom House; Mr. T. Hillier Pyke, cinematograph theatre, Rathbone and Pitt streets, Canning Town.

BOOKS.

Practical Road Engineering for the New Traffic Requirements. Compiled from the Special "Roads" Issues of the *Surveyor and Municipal and County Engineer*. By H. PERCY BOULNOIS, M.Inst.C.E., F.R.San.I., etc. (London: The St. Bride's Press, Ltd. 1910. Price 5s. net.)

AT a time when the question of our roads and their adaptation to the requirements of modern traffic conditions is so prominent this book has an especial interest. It contains a collection of articles in book form by well-known experts which previously appeared in the *Surveyor and Municipal and County Engineer*. These are divided into convenient sections.

An introduction by Mr. H. Percy Boulnois, M.Inst.C.E., is an excellent summary and commentary on the subject matter of the various articles which follow. Sects. 1 to 8 deal with the different questions involved from the construction up to the administration of roads. Sect. 9 gives the personal experiences of engineers in the tar treatment of road surfaces. Sect. 10 is a glossary of proprietary road materials, and should prove distinctly useful for reference. Sect. 11 is a reprint of four premium papers (published by the *Surveyor*) on subjects arising out of the previous articles. The text contains several wood-cuts and tabulated data, and a full index of the contents is added.

BOOKS—*Continued on page 60.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xix.; Auction Sales, xxiv.

Certain conditions beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

***** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.**

Competitions.

JANUARY 14.—**Knightsbridge.**—Complete particulars of a competition for remodelling part of the Trevor Estate, Knightsbridge, will be found on page xvi. of our issue of October 15.

JANUARY 15. — **Berlin.** — The laying out of Rudesheim Square. Particulars gratis from the Direktion der Gesellschaft, Charlottenstrasse 60. See "Competition News" in our issue of November 26.

JANUARY 18. — **London, S.E.** — CENTRAL LIBRARY.—The Deptford B.C. invite designs for Central Library, Deptford. Three premiums are offered. See advertisement in issue of January 6 for further particulars.

JANUARY 21. — **Taunton.** — DESIGN FOR A NEW ELEMENTARY SCHOOL.—Open to architects practising in the Borough of Taunton. Particulars from Mr. George H. Kite, Town Clerk, Municipal Buildings, Taunton.

JANUARY 30. — **Bristol.** — COTTAGES AND GARDENS. — Competition open to architects, builders, and others at the Housing and Cottage Exhibition, Bristol. See advertisement in issue of January 6 for further particulars.

JANUARY 31. — **Glasgow.** — BRANCH LIBRARY.—The Corporation invite competitive plans of a Branch Library proposed to be erected at Possilpark. The terms and conditions of the competition may be obtained on application to the Subscriber. Mr. A. W. Myles, Town Clerk, City Chambers, Glasgow.

FEBRUARY 1. — **Hull.** — The Guardians invite competitive designs for a suite of offices proposed to be erected on land in Margaret-street, Hull. Particulars as to the accommodation required will be furnished on application to Mr. J. H. Wild, Solicitor, Clerk to the Guardians, 12, Harley-street, Hull.

FEBRUARY 28. — **Corbridge.** — SEWERAGE AND SEWAGE DISPOSAL.—The Hexham R.D.C. invite duly qualified civil engineers to submit schemes for the sewerage and sewage disposal of the Village of Corbridge. Information as to the existing sewers, etc., can be obtained from the Sanitary Inspector (Mr. M. Waugh, The Mount, Haydon Bridge), or from the Clerk to the Parochial Committee (Mr. E. Pearson, Corbridge).

MARCH 15. — **San Salvador.** — SCHEME FOR A CITY THEATRE. — First premium, 8,000 francs; second, 4,000 francs. Particulars from Mr. M. J. Kelly, 8, Idol-lane, E.C.

* MARCH 31.—**Manchester.**—LIBRARY AND ART GALLERY. — The Manchester Corporation invite designs for Library and Art Gallery upon the Piccadilly site. See advertisement in this issue for further particulars.

MARCH 31. — **Romford.** — The Town Planning and Modern House and Cottage Exhibition invite designs for the general plan of Gidea Park, Squirrels Heath, Romford. For further particulars see advertisement in our issue of September 17, and of October 8.

MARCH 31.—**Trondhjem, Norway.**—PROPOSED HARBOUR AND RAILWAY EXTENSION.—Competitive designs for above are invited by the Joint Committee of the State Railways and the City Harbour Commissioners. See our issue of November 5, page 563, and that of October 15, page 444, for further information.

APRIL 1.—**Coventry.**—MUNICIPAL OFFICES.—The Coventry Corporation invite competitive designs for erection of Municipal offices and a Town Hall, to cost 50,000*l.* Premiums of 150*l.* (supplementary), 175*l.*, and 125*l.* Mr. E. Guy Dawber, F.R.I.B.A., has been appointed assessor. See article on page 686 and advertisement on page iv. in our issue of December 3. Also see advertisements in issues of November 19 and January 6 for further particulars.

APRIL 15.—**Havana.**—Project for a Presidential Palace. See "Competition News" in issue of November 26. Particulars may be obtained at the Cuban Legation, 3, Grosvenor-mansions, Victoria-street, S.W.

JUNE 10. — **Aspatria, Cumberland.** — The U.D.C. invite engineers to submit plans and estimates of a scheme of sewerage and sewage disposal for their district. The surveyor will give particulars required, and plans and estimates must be delivered to Mr. F. Richardson, Clerk to the Council, Aspatria, Cumberland, on or before June 10 next.

AUGUST 15.—**Berne.**—Designs for the erection of a monument at Berne to celebrate the foundation of the International Telegraph Union. Conditions may be seen in the library of the Royal Institute of British Architects.

NOVEMBER 1. — **City of St. Petersburg.** — MONUMENT TO ALEXANDER II.—Particulars in our issue of August 13, 1910.

DECEMBER 29. — **Glasgow.** — DESIGN FOR A BRIDGE.—Designs are invited (Alexander Thomson Travelling Studentship) for a bridge. Premiums of 60*l.* and 20*l.* are offered. See advertisement in issue of December 24 for further particulars.

NO DATE. — **Bradford.** — INFIRMARY. — The Board of Management of the Bradford Royal Infirmary invite competitive plans, with estimates, for the erection of a new infirmary on a site in Duckworth-lane. See advertisement in issue of December 31 for further particulars.

NO DATE.—**Leicester.**—PROPOSED PUBLIC HALL. —The Corporation invite the practising architects of Leicester, having offices in the town, to supply plans, designs, and estimates for the construction of a new Public Hall, proposed to be erected on land adjoining the Victoria Park and Regent-street. Conditions of competition can be obtained on application, accompanied by a deposit of 1*l.* 1s., being made to Mr. E. George Mawbey, M.Inst.C.E., Borough Surveyor, Town Hall, Leicester.

NO DATE.—**Llandrindod Wells.**—The U.D.C. invite designs for a pavilion in the Recreation Ground. Particulars from Mr. D. C. Davies, Clerk to the U.D.C., Llandrindod Wells.

NO DATE.—**Penistone.**—Competitive plans and specifications are invited for a "Carnegie" Free Library at Penistone. Plans of site and particulars can be obtained on application to the Clerk to the D.C., Penistone.

NO DATE.—**Rio de Janeiro.**—The Chamber of Deputies of Brazil contemplate the erection of a Faculty of Medicine, with a clinical hospital, in Rio de Janeiro. Conditions may be seen at the Office National du Commerce, 3, Rue Feydeau, Paris.

NO DATE.—**Southampton.**—NEW BUILDINGS. —The Council of Hartley University College invite designs for proposed new buildings. See advertisement in issue of January 6 for further particulars.

NO DATE. — **Southport.** — DESIGN FOR A NEW PUBLIC ELEMENTARY SCHOOL.—Open to architects practising in the Borough and in Birkdale. Particulars from Mr. J. Ernest Jarratt, Town Clerk, Town Hall, Southport.

Contracts.

BUILDING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

JANUARY 14-27.—**Heywood.**—COUNCIL SCHOOL.—The T.C invite tenders for the erection of the proposed Heap Bridge Council School. Drawings, etc., can be inspected at the office of Mr. H. Cooper Anderson, A.R.I.B.A., M.S.A., architect and surveyor, 3, Longford-street, Heywood, to whom names must be submitted not later than the 14th inst. Quantities will be supplied on deposit of 3*l.* 3s.

JANUARY 15.—**Carnarvon.**—ADDITIONS TO INSTITUTE PREMISES.—For making additions to the Institute, Carnarvon. Plans, etc., are to be seen at the office of Mr. Rowland Lloyd Jones, architect, 14, Market-street, Carnarvon.

JANUARY 15-26.—**Knottingley.**—ADDITIONS TO SCHOOLS.—For alterations and additions to the Church Schools. Names to Messrs. Tennant & Collins, architects and surveyors, Pontefract, not later than the 15th inst.

JANUARY 16. — **Bearwood, Smethwick.** — MISSION CHURCH.—For the erection of new Mission Church of St. Dunstan. Names, together with a deposit of 1*l.* 1s., to Mr. S. N. Cooke, architect, 33, Newhall-street, Birmingham, with whom plans may be seen.

JANUARY 17.—**Doncaster.**—ALTERATIONS, ETC.—The West Riding Standing Joint Committee invite whole or separate tenders for alterations, etc., to the Doncaster Court-house. Plans may be seen, and specifications, etc., obtained, on application to Mr. J. Vickers Edwards, West Riding Architect, County Hall, Wakefield. A sum of 1*l.* in each case must be sent by separate letter to the West Riding Treasurer, County Hall, Wakefield.

JANUARY 17.—**Grassington.**—POLICE-STATION.—The West Riding Standing Joint Committee invite whole or separate tenders for the erection of new police-station. Plans may be seen, and specifications, etc., obtained, on application to Mr. J. Vickers Edwards, West Riding Architect, County Hall, Wakefield. A sum of 1*l.* in each case must be sent by separate letter to the West Riding Treasurer, County Hall, Wakefield.

* JANUARY 17.—**London, E.**—BUILDING AND REPAIRS.—The Territorial Force Association of the County of Essex invite tenders for building and repairs at Artillery House, Stratford, E. See advertisement in this issue for further particulars.

JANUARY 17.—**Mountain Ash.**—ALTERATIONS.—The Duffryn Co-operative Society, Ltd., invite tenders for the alteration of premises. Plans, etc., can be seen at Messrs. Morgan & Elford's Offices, architects, Mountain Ash.

JANUARY 17.—**Southend-on-Sea.**—ALTERATIONS AND ADDITIONS.—The Corporation invite tenders for alterations and additions to the existing barn at Chalkwell Park, to be used as a battery storage room. Plans, etc., may be seen, and quantities, etc., obtained, on deposit of a cheque for 1*l.* 1s., upon application to Mr. Ernest J. Elford, M.I.M.E., Borough Engineer and Surveyor.

JANUARY 18.—**Aberfan.**—HOUSES; ALSO ROADS, SEWERS, ETC.—For the erection of twenty-five or more houses, together with the construction of roads, sewers, surface-water drains, etc., for the Pleasant View Building Club. Plans, etc., may be seen at the office of Mr. O. P. Bevan, architect and surveyor, Express-chambers, Merthyr Tydfil.

JANUARY 18.—**Birnie, Elgin.**—SCHOOL ALTERATIONS AND ADDITIONS.—For the various works required in carrying out additions and alterations at Birnie School. Plans, etc., may be seen with Mr. Charles C. Doig, architect, 149, High-street, Elgin.

JANUARY 18.—**Rose Grove, near Burnley.**—REPAIRS TO WAREHOUSE ROOF AND FLOORS.—The Directors of the Lancashire and Yorkshire Railway invite tenders for the restoration of the roof and floor of the goods warehouse at Rose Grove. Plans can be seen, and quantities, etc., obtained, on application at the Engineer's Offi Hunt's Bank, Manchester.

JANUARY 18.—**Stoke-on-Trent.**—ALTERATIONS AT WORKHOUSE.—The Guardians invite provisional tenders for certain works of alteration and adaptation to the old administrative block at the Spittals Workhouse. Drawings, etc., may be seen during ordinary office hours at the office of Mr. A. R. P. Piercy, Architect to the Union, at the Union Offices, Stoke-upon-Trent, and quantities may be obtained on deposit of 1*l.* 1s.

JANUARY 18. — **Tinsley.** — LAYING-OUT PARK, CONVENIENCES, ETC.—The P.C. invite tenders, in connexion with their recreation ground, for the construction of conveniences, making ornamental gardens, etc. Plans, etc., can be seen at the Free Library, Tinsley.

JANUARY 19.—**Manchester.**—PARK LODGE.—The Parks Committee invite tenders for the erection of a lodge at Brookdale Park. Drawings may be seen, and specification obtained, at the office of the City Architect, Town Hall, upon payment to the City Treasurer of 1*l.* 1s. All cheques or postal orders to be made payable to the order of "The Corporation of Manchester."

* JANUARY 20.—**Devonport.**—POST-OFFICE EXTENSION.—The Commissioners of H.M. Works and Public Buildings invite tenders for extension of Post-office. See advertisement in this issue for further particulars.

* JANUARY 21. — **Epping.** — INFIRMARY AND MASTER'S HOUSE.—The Epping Board of Guardians invite tenders for the erection of an infirmary and master's house, together with contingent works at the Epping Workhouse. See advertisement in this issue for further particulars.

JANUARY 21.—**Tanyfynwent, Aber.**—ALTERATIONS AND ADDITIONS.—For alterations and additions to Tanyfynwent, Aber, near Bangor, for the University College of North Wales. Drawings, etc., may be seen at the offices of Mr. Evan Evans, architect, 8, Castle-street, Carnarvon.

JANUARY 23.—**Englishcombe, near Bath.**—ADDITIONS, ETC., TO COUNCIL SCHOOL.—Somerset C.C. invite tenders for the erection of two cloak-rooms and the execution of certain alterations and repairs at the Council schools. Plans, etc., may be seen either at the schoolhouse or at the office of Mr. W. F. Bird, M.S.A., Midsomer Norton, and quantities, with forms, may be obtained from the latter on application.

JANUARY 23. — **Farnham.** — ALTERATIONS AND ADDITIONS TO DRILL HALL.—The Territorial Force Association of the County of Surrey invite tenders for carrying out the alterations and additions to existing drill hall premises, Bear-lane. Drawings, etc., may be seen on application to Messrs. Jarvis & Richards, Architects to the Association, 10, Queen Anne's-gate, Westminster, S.W. Quantities and forms may be obtained from Messrs. Robinson & Roods, quantity surveyors, 8, New-court, Carey-street, Lincoln's-inn, W.C., on payment of 1*l.* 1s.

* JANUARY 23.—**Slough.**—ADDITIONS.—Tenders are invited for additions to Messrs. Jeayes, Kasner, & Co.'s "Furniture Depository." See advertisement in this issue for further particulars.

JANUARY 23.—**Sowerby Bridge.**—GASWORKS EXTENSION.—The U.D.C. invite tenders for extensions at their gasworks. Drawings can be inspected and copied, and, upon payment of 3*l.* 3s., specification, etc., and any information required,

BUILDING—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

can be obtained from Mr. A. W. Bissell, Engineer, Gasworks, Sowerby Bridge.

* JANUARY 24.—**London, E.**—SANITARY CONVENIENCES.—The West Ham Council invite tenders for sanitary conveniences, Victoria Dock-road. See advertisement in this issue for further particulars.

JANUARY 25.—**Carleton, near Pontefract.**—COTTAGE HOME.—Pontefract Guardians invite tenders for the erection of a cottage home. Plans, etc., may be seen, and quantities, etc., obtained, on application to the architects, Messrs. Garside & Pennington, of Pontefract and Castleford, on or after the 17th inst., and on deposit of 10s.

JANUARY 25.—**Dorchester.**—POLICE CELLS.—For the erection of new police cells in Glyde Path-road, Dorchester, for the Standing Joint Committee of the Dorset County Council. Plans, etc., may be seen at the County Surveyor's Department, County Offices, Dorchester.

* JANUARY 26.—**Blackburn.**—ALTERATIONS AND ADDITIONS.—The Commissioners of H.M. Works and Public Buildings invite tenders for alterations and additions to County Court, Blackburn. See advertisement in this issue for further particulars.

JANUARY 30.—**Margate.**—CONCERT HALL, ARENA, AND COLONNADE.—The Corporation invite tenders for the general builders' work in the erection of a large concert hall, with arena and caionnade, at the Fort. Plans may be seen, and specification, etc., obtained, at the office of Mr. Ernest A. Borg, Borough Engineer, 13, Grosvenor-place, Margate, upon payment of 5*l.* 5s.

* JANUARY 31. — **Aldershot.** — SCHOOL. — The Aldershot U.D.C. invite tenders for new secondary school at Aldershot. See advertisement in this issue for further particulars.

JANUARY 31.—**Ayr.**—QUAY WALL RECONSTRUCTION.—The Harbour Trustees invite tenders for the reconstruction of a portion of the north quay wall. Plans may be seen at the office of the engineers, Messrs. Crouch, Hogg, & Easton, C.E., 14, Blythswood-square, Glasgow, from whom copies of the specification, etc., may be obtained on payment of 5*l.* 5s.

* JANUARY 31.—**Eltham.**—GYMNASIUM AND ART-ROOM.—The London C.C. invite tenders for gymnasium and art-room in the Avery-hill College site, Eltham. See advertisement in this issue for further particulars.

FEBRUARY 1.—**Machrihanish, Argyllshire.**—LIFEBOAT-HOUSE AND SLIPWAY.—The Committee of Management of the Royal National Lifeboat Institution invite tenders for the construction of a stone lifeboat-house and reinforced-concrete (Considère system) slipway at Port Namarve, near Machrihanish. Plans, etc., may be inspected on application to the local Hon. Secretary, Mr. J. A. Gardiner, Campbeltown, Argyllshire, or at the office of the engineer and architect, Mr. W. T. Douglass, M.Inst.C.E., 15, Victoria-street, Westminster, S.W., on or after the 18th inst. Quantities, etc., may be obtained on and after the same date from the Engineer and Architect, accompanied by a deposit of 1*l.*

FEBRUARY 1.—**Old Sodbury.**—SCHOOL ENLARGEMENT.—For carrying out alterations and enlargement of Old Sodbury School. Plans, etc., can be seen at Mr. W. C. Willcox's, Old Sodbury House, near Chipping Sodbury.

FEBRUARY 1.—**Peterhead, Aberdeenshire.**—LIFEBOAT HOUSE AND SLIPWAY.—The Committee of Management of the Royal National Lifeboat Institution invite tenders for the construction of a corrugated steel and timber lifeboat house and solid concrete and reinforced concrete (Considère system) slipway on a site adjoining Lodge-walk. Plans, etc., may be inspected on application to the Local Hon. Secretary, Mr. Robert Gray, Peterhead, Aberdeenshire, or at the office of the engineer and architect, Mr. W. T. Douglass, M.Inst.C.E., 15, Victoria-street, Westminster, S.W., on or after the 11th inst. Quantities, etc., may be obtained on and after the same date on application to the engineer and architect, accompanied by a deposit of 1*l.*

* FEBRUARY 6.—**Farnham.**—ADDITIONS, ETC.—The Territorial Force Association of the County of Surrey invite tenders for alterations and additions to existing drill hall premises. See advertisement in this issue for further particulars.

FEBRUARY 6.—**Longford.**—STATION STORE.—The Directors of the Midland Great Western Railway of Ireland Company invite tenders for the erection of a store at their **Longford Station**. Specification, etc., can be seen at the office of the Chief Engineer, at Broadstone Station, and where, also, for a charge of 5s. (not returnable) they can be copied.

FEBRUARY 7.—**Treforest.**—VILLAS.—For the erection of eighteen semi-detached villas. Plans and specifications can be inspected at the office of Messrs. Gibson, Parry Williams, & Co., architects and surveyors, Capital and Counties Bank-chambers, Pontypridd.

FEBRUARY 8.—**Ennis, Co. Clare.**—ADDITIONS, ETC., TO CATHEDRAL.—For the whole of the work in connexion with proposed additions and alterations to the Cathedral, Ennis. Plans, etc., can be seen at the Presbytery, Ennis, up to February 1.

* FEBRUARY 20.—**Ongar (near).**—EXTENSION OF SCHOOL.—The West Ham Education Committee invite tenders for extension and alteration of Industrial and Truants' School, Fyfield, near Ongar, Essex. See advertisement in this issue for further particulars.

NO DATE.—**Aldershot.**—ALTERATIONS AND ADDITIONS TO FACTORY.—For making certain alterations and additions to mineral water factory, Arthur-street, Aldershot, for Messrs. Barratt & Co. Plans, etc., can be seen, and any further information obtained, upon application to Messrs. Friend & Lloyd, architects, Aldershot.

NO DATE.—**Belfast.**—SHOPS.—The building of four small shops in North Queen-street. For particulars apply to Messrs. E. & J. Byrne, architects, 4, Waring-street.

NO DATE.—**Collingham.**—VILLAS.—Tenders invited for any or all trades in erection of villas. For quantities apply to Mr. Charles H. Brooke, architect, Cookridge-street, Leeds, and Collingham.

NO DATE.—**Highfield.**—COTTAGES.—For the erection of fourteen cottages at Highfield, near Rowlands Gill, for the Burnopfield Co-operative Society. Quantities can be obtained from the architect, Mr. A. C. Wood, Burnopfield.

NO DATE.—**Highfield, near Rowlands Gill.**—HOUSES.—For the erection of two houses, for the Burnopfield Co-operative Society. Applications to be addressed to the architect, Mr. A. C. Wood, Burnopfield, for quantities.

ENGINEERING, IRON, AND STEEL.

JANUARY 16. — **Salisbury.** — WROUGHT-IRON SCREEN.—The U.D.C. invite tenders for supplying a wrought-iron screen, weighing about 35 cwt., for the sewage disposal works. Drawings may be seen, and specification, etc., obtained, on application to Mr. W. J. Goodwin, A.M.Inst.C.E., City Engineer and Surveyor, Municipal Offices, Salisbury.

JANUARY 16.—**Wallasey.**—WROUGHT-IRON RAILINGS AND GATES.—The Parks Committee invite tenders for the supply of unclimbable wrought-iron railings, with four sets of gates. Specification, etc., may be obtained on application to the Borough Engineer and Surveyor, Mr. W. H. Travers, A.M.Inst.C.E., Falkland-road, Egremont, Wallasey.

JANUARY 17.—**India.**—STEEL MATERIAL.—The Directors of the Bombay, Baroda, and Central India Railway invite tenders for the supply of steel material. Forms, etc., can be obtained at these offices, on payment of 1*l.* 1s. each (which will not be returned), from Mr. C. Crommelin, Secretary, Gloucester House, 110, Bishopsgate, London, E.C.

JANUARY 18.—**Ponteland.**—CORRUGATED-IRON BUILDING.—For the erection of a corrugated-iron building at the Cottage Homes. Plan, etc., can be seen at the office of Mr. Gladstone Walker, Clerk to the Guardians, Union Offices, 127, Pilgrim-street, Newcastle-on-Tyne.

JANUARY 20.—**Ickenham.**—REINFORCED-CONCRETE BRIDGE.—Uxbridge R.D.C. invite tenders for the demolition of the existing bridge and the construction of a reinforced-concrete bridge, over the River Pinn, in the Back-lane. Plans can be seen, and specification, etc., obtained, at the office of the Surveyor, Mr. John Wm. Harrison, Corn Exchange, Uxbridge, on payment of 1*l.* The office hours are 9 a.m. to 10 a.m., or at any other time by appointment.

JANUARY 21.—**Poole.**—CAST-IRON PIPES.—The Corporation invite tenders for the supply of cast-iron pipes for the ensuing twelve months. Specification, etc., may be obtained at the office of the Waterworks Engineer and Manager, Municipal-buildings, Poole, Dorset.

JANUARY 23.—**Annfield Plain.**—ELECTRIC INSTALLATION.—For work to be done in completing the electric installation at the Electric Theatre, Annfield Plain, for Mr. R. J. W. Bloom. Plans, etc., may be seen, and particulars obtained, from Mr. L. H. Armour, 16, West-street, Gateshead.

JANUARY 24.—**Belfast.**—STEEL UNDERBRIDGES.—The Directors of the Great Northern Railway Company (Ireland) invite tenders for the supply and delivery only, at Belfast Station, of nine steel underbridges. Drawings, etc., may be obtained, on payment of 2*l.*, from Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin.

JANUARY 24.—**Dunton Green.**—BRIDGE WIDENING.—For the widening of Longford Bridge, for the Bridges and Roads Committee of the Kent C.C. Quantities, etc., can be obtained, and plan and specification inspected, at the office of Mr. Frederick W. Ruck, County Architect, 86, Week-street, Maidstone.

JANUARY 30.—**Padstow, North Cornwall.**—JETTY AND SOLID PIER.—The Commissioners of Padstow Harbour invite tenders for the construction of a new solid pier or jetty in concrete and masonry, and for other works in connexion therewith. Conditions, etc., may be obtained, and drawings inspected, at the Harbour Office, Padstow, or on application to Messrs. G. Croydon Marks and Edward C. R. Marks, consulting engineers, 57 and 58, Lincoln's Inn-fields, London, on deposit of 2*l.*

* JANUARY 31. — **Birmingham.** — REINFORCED CONCRETE.—The Commissioners of H.M. Works and Public Buildings invite tenders for reinforced concrete work at Telegraph Stores Building (Block 6), Bordesley, Birmingham. See advertisement in this issue for further particulars.

FEBRUARY 2.—**Shanghai.**—STEEL STRUCTURAL WORK.—The Municipal Council of Shanghai invite tenders for the supply and delivery, c.i.f. Shanghai, of steel structural work for power-station buildings (contract No. 3). Specifications, etc., may be obtained from Messrs. Preece, Cardew, & Snell, 8, Queen Anne's-gate, Westminster, S.W., on deposit of 2*l.*

FEBRUARY 13.—**Dublin.**—STEEL RAILS, ETC.—The Directors of the Midland Great Western Railway of Ireland Company invite tenders for the supply of steel rails and fishplates, in accordance with specification, which can be obtained on application to the Chief Engineer of the Company, Broadstone Terminus, Dublin, on payment of 2s. 6d. (not returnable).

FURNITURE, PAINTING, MATERIALS, etc.

JANUARY 17.—**West Didsbury, Manchester.**—SCHOOL FURNITURE.—Guardians of the Township of South Manchester invite tenders for the supply of the school furniture required at the school connected with the Dr. Rhodes's Memorial Home, Cavendish-road. Full particulars may be obtained on application to the Superintendent of the Home.

JANUARY 21.—**Cuckfield.**—ROADMEN'S TOOLS, ETC.—The R.D.C. invite tenders for the supply of roadmen's tools, team labour, etc. Further particulars and forms can be obtained on application to Mr. A. MacArthur, C.E., Surveyor, Council Offices, Haywards Heath.

JANUARY 21. — **Thirsk.** — FURNISHING FEVER HOSPITAL.—The R.D.C. invite tenders for furnishing the Fever Hospital. Particulars may be obtained from Mr. Thomas Stokes, Architect, Thirsk.

* JANUARY 24. — **Deptford, S.E.**—PAINTING.—The London C.C. invite tenders for painting works at the two beam engine-houses and boiler-house at Pumping Station, Deptford. See advertisement in this issue for further particulars.

* JANUARY 26.—**Lambeth, S.E.**—WORKS AND MATERIALS.—The Lambeth B.C. invite tenders for services and materials for one year from March 31 next. See advertisement in this issue for further particulars.

* JANUARY 27.—**Southampton.**—TYPEWRITING, LITHOGRAPHY, PHOTO-PRINTING. — The Southampton C.C. invite tenders for typewriting, lithography, and photo-printing. See advertisement in this issue for further particulars.

JANUARY 28.—**Bishop Auckland.**—BUILDING MATERIALS, ETC.—The U.D.C. invite tenders for supplying sanitary pipes, paint, bricks, cement, etc. Full particulars and forms can be obtained on application to the Surveyor, Town Hall-buildings.

JANUARY 28. — **Bourne, Lincs.** — ROADMEN'S TOOLS.—The R.D.C. invite tenders for the supply of roadmen's tools, etc. Particulars and forms may be obtained on application to Mr. Thomas Lake, District Surveyor, Bourne.

JANUARY 28. — **Cheltenham.** — BUILDING MATERIAL, ETC.—The Corporation invite tenders for the supply of Portland cement, stoneware pipes, ironmongery, timber, lias lime, bricks, etc. Forms of tender may be obtained from Mr. J. S. Pickering, Borough Engineer, Municipal Offices, Cheltenham.

* JANUARY 30. — **Dartford.** — PAINTING AND REPAIRS.—The Dartford Joint Hospital Committee invite tenders for painting and repairs at staff quarters of their Infectious Diseases Hospital, Bow Arrow-lane. See advertisement in this issue for further particulars.

JANUARY 31.—**East Ardsley.**—SLIDING PARTITION.—For erection of sliding partition in East Ardsley School. Specifications obtained from Mr. Alexander Angus, W.R., Education Office, Wakefield.

* JANUARY 31. — **London.** — WORKS AND MATERIALS.—The Metropolitan Water Board invite tenders for supply of stores and execution of works for twelve months ending March 31, 1912. See advertisement in this issue for further particulars.

FEBRUARY 1.—**Manchester.** — PAINTING.—The Directors of the Lancashire and Yorkshire Railway invite tenders for painting. Specifications and forms of tender may be obtained on personal application at the Engineer's Office, Hunts Bank, Manchester.

* FEBRUARY 4.—**Paddington, W.**—DISPOSAL OF SLOP, ETC.—The Paddington B.C. invite alternative tenders for one, two, or three years from March 31 next for disposal of the slop, rough dust, etc., collected in parts of the borough. See advertisement in this issue for further particulars.

FEBRUARY 9.—**London.**—SUPPLIES.—The Bermondsey Guardians invite tenders for the supply of stores. Forms of tenders, etc., may be obtained on written application, enclosing stamped full-size envelope to Mr. E. Pitts Fenton, Clerk to the Guardians, 283, Tooley-street, S.E.

FEBRUARY 11.—**Salisbury.**—STORES, ETC.—The U.D.C. invite applications for the appointment for one year of carpenter and bricklayer, plumber and painter, and ironmonger; also tenders for the supply of stores. Particulars, etc., for the stores can be obtained at the office of the City Engineer and Surveyor, Endless-street.

NO DATE.—**Liverpool.**—TIMBER.—The Leeds and Liverpool Canal Company invite tenders for the supply of English oak, larch, and ash timber. Forms of tender, etc., may be obtained on application to the Engineer, Leeds and Liverpool Canal Company, Pall Mall, Liverpool.

ROADS, SANITARY, AND WATER WORKS.

JANUARY 19.—**Hendon.**—MAKING-UP, ETC.—The R.D.C. invite tenders for kerbing, channelling, paving, and making-up, etc., certain roads in the district. Conditions, etc., may be seen at the offices of Mr. J. A. Webb, Engineer and Surveyor to the Council, Stanmore, where forms, etc., can be obtained upon deposit of 5*l.* 5s.

JANUARY 19.—**Oldham.**—STREET WORKS.—The Surveyor's Committee invite tenders for sewering, paving, and completing a number of streets and passages. Plans, etc., can be seen, and quantities, etc., obtained, at the Borough Surveyor's Office.

JANUARY 21.—**Hailsham.**—ROAD MATERIALS AND CARTAGE.—The R.D.C. invite tenders for the supply of road materials and for cartage of same. Three forms have been prepared, as follows:—(*a*) For the supply of materials to be delivered by rail to stations; (*b*) for the supply of materials to be delivered to the sides of the roads; or (*c*) for cartage of materials from the railway stations to the sides of the roads. Forms, stating which

ROADS, etc.—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

required, can be obtained from Mr. Edmund Catt, Clerk to the Council, Clerk's Office, 17, London-road, Hailsham.

JANUARY 24.—**Bo'ness.**—WATER MAIN.—The T.C. invite tenders for the excavating, laying, and jointing of four miles of 10-in. diameter cast-iron pipes. Forms, etc., and any other information required, can be had from Mr. John Louden, Burgh Surveyor, Bo'ness.

JANUARY 24.—**Shardlow.**—ROAD MATERIAL.—The R.D.C. invite tenders for the supply and delivery of certain road materials for one year. Forms of tender, etc., to be obtained from Mr. John S. Wooddisse, Surveyor to the Council, Surveyor's Office, Aston-on-Trent, Derby.

* JANUARY 25.—**London, E.C.**—PAVING WORKS.—The Streets Committee of the Corporation of London invite tenders for paving various streets with wood or asphalt. See advertisement in this issue for further particulars.

JANUARY 27.—**Warren Heath, Hants.**—SETTLING TANKS, FILTERS, ETC.—The Hartley Wintney R.D.C. invite tenders for the construction of settling tanks and filters, and other work, at the waterworks. Drawings, etc., may be seen at the office of Mr. F. L. Wetherall, Clerk to the Parish Council of Hartley Wintney. Copies of specification, etc., may be obtained from the engineers, Messrs. Belshaw & Co., 53, Victoria-street, London, S.W., on deposit of 3*l.* 3s.

JANUARY 28.—**Bourne, Lincs.**—GRANITE AND SLAG.—The R.D.C. invite tenders for the supply of about 6,000 tons of granite and 2,000 tons of slag, at per ton. Forms to be obtained on application to Mr. Thomas Lake, District Surveyor, Bourne.

JANUARY 28.—**Newquay, Cornwall.**—SEWERAGE WORKS.—The U.D.C. invite tenders for carrying out certain works of sewerage (three contracts). Drawings, etc., may be seen at the office of the Engineer, Council-chambers, Beach-road, between 11 a.m. and 4 p.m., and copies of specifications, quantities, etc., may be obtained upon payment of 5*l.*

JANUARY 30.—**Winchester.**—ROAD MATERIAL.—Southampton C.C. invite tenders for the supply of stone for the repair of the main roads for one year. Forms of tender, etc., may be obtained on application to Mr. W. J. Taylor, County Surveyor, The Castle, Winchester.

FEBRUARY 2.—**Isle of Ely.**—GRANITE, ETC.—The C.C. invite tenders for the supply of broken materials for the repair of main roads for one year. Specifications, etc., can be obtained upon the receipt of a stamped addressed foolscap envelope at the offices of Mr. H. Farr Simpson, County Surveyor, Northern Division, Wisbech, or Mr. R. S. W. Perkins, County Surveyor, Southern Division, Ely.

FEBRUARY 3.—**Hatfield.**—GRANITE AND SLAG.—Hertfordshire C.C. invite tenders for the supply of broken granite and slag required for the main roads for one year. Forms, etc., may be obtained on application at the office of Mr. Urban A. Smith, M.Inst.C.E., County Surveyor, County Surveyor's Office, Hatfield, upon receipt of a stamped addressed foolscap envelope.

FEBRUARY 6.—**Cross Bank.**—EXTENSION OF SEWAGE WORKS.—The Limehurst R.D.C. invite tenders for the extension of sewage works. Plans, etc., may be seen at the office of the Engineer, Mr. H. Leonard Hinnell, M.Inst.C.E., 41, Corporation-street, Manchester, on and after January 16, and quantities obtained on deposit of 1*l.*

FEBRUARY 27.—**Little Hulton.**—ROAD MATERIAL, ETC.—The U.D.C. invite tenders for the supply of granite, cement, flags, etc., for the year. Forms of tender and particulars can be obtained from Mr. James H. Heyes, Clerk, Council Offices, Little Hulton.

MARCH 7.—**Ely Valley.**—SEWERAGE SCHEME.—Llantrisant and Llantwit Fardre R.D.C. invite tenders for carrying out the Ely Valley sewerage scheme. Drawings may be seen by appointment, and specification, etc., obtained on application to Mr. Thomas Saunders, Engineer and Surveyor, School-street, Pontyclun, on or after the 23rd inst., upon deposit of 10*l.*

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*DISTRICT SURVEYOR OF MAIN ROADS AND BRIDGES	Lincs. C.C. (Parts of Holl'd)	150*l.* per annum	Jan. 19
*ESTATE CLERK OF WORKS	Glamorgan C.C.	See advertisement in this issue	Jan. 24
*MANUAL TRAINING INSTRUCTOR	Kent Education Committee	130*l.*	No date.

Auction Sale.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*STOCK OF BUILDER'S AND GENERAL IRONMONGERY, ETC.—At 4, Appold-street, E.C.	J. T. Skelding & Holland	Jan. 24

BOOKS—*Continued from page 57.*

It will be noted that a considerable space is devoted to the question of the surface treatment of roads—a most important matter in view of high-speed motor traffic and its attendant dust and wear of the surface of the road. The reports of the actual results of what has been accomplished in this direction in all parts of the country are most instructive. Throughout the articles the question of cost has received full attention, and many data on this most essential point are given.

This book is most interesting reading, containing as it does in concise form much practical and up-to-date information on roads. It puts our knowledge of the road engineering problem, as it stands to-day, in a compact and handy form. Though the facts, data, and suggestions made will appeal mainly to the technical reader, the articles contain much that will interest the general reader, who obtains the ultimate benefit of the road engineer's work.

Houses, Villas, Cottages, and Bungalows. By GEORGE GORDON SAMSON. (Crosby Lockwood & Son. 3s. 6d.)

THIS book is a sequel to "How to Plan a House," which, being concerned chiefly with interiors, did not refer adequately to general features. It is somewhat elementary in character, and will appeal, perhaps, more to the prospective patron than to the practised architect. Nevertheless, many hints may be taken from the plans and other illustrations of buildings, many of which have stood the test of production and occupation. The costs, from 100*l.* upwards, are given in pounds, francs, and dollars, as one of the objects of the book is to help architects who are building on the Continent and abroad.

BOOKS RECEIVED.

THE CATHEDRALS OF NORTHERN FRANCE. By T. FRANCIS BUMPUS. Pp. 396. (T. Werner Laurie. 6s. net.)

BUTTERWORTH'S WORKMEN'S COMPENSATION CASES. Vol. III. (new series). Edited by Judge RUEGG, K.C., and DOUGLAS KNOCKER, Barrister-at-Law. Pp. 621. (Butterworth & Co.)

THE CHEMISTRY AND TESTING OF CEMENT. By CECIL H. DESCH, D.Sc. (Lond.), Ph.D. (Würzb.). Pp. 267. (Edward Arnold. 10s. 6d. net.)

PATENTS.

APPLICATIONS PUBLISHED.*

29,244 of 1909.—Louis Broussas: Reinforced brickwork, floors, and ceilings.

29,887 of 1909.—William Clark Mitchell: Excavating buckets.

30,097 of 1909.—Elias Bernard Koopman: Jointing or binding together of members in metal structures by electric welding.

920 of 1910.—John Cosstick: False bottoms for kitchen range and like grates.

3,929 of 1910.—William Adolphus Smyrk: Scaffoldings.

6,610 of 1910.—Frank Wilford Mellowes and Hugh White: Flushing siphons.

7,200 of 1910.—Heinrich Max Seyferth: Attic or the like windows.

9,183 of 1910.—Edgar Bolhoro von Norden-Kampf: Means for mounting stones for mosaic coverings.

9,224 of 1910.—Mary Ewart Cambell: Baths.

10,152 of 1910.—Percy Wheater (Tomkies): Apparatus for cutting corrugated and other metal sheets.

10,285 of 1910.—Johann Virck: Concrete floor and ceiling.

10,287 of 1910.—Johann Virck: Concrete floor and ceiling.

10,367 of 1910.—Hermann Schlisske: Reinforced cardboard for use as roofing plates and for other purposes.

10,974 of 1910.—Othon Troupenat: Safety devices for saws.

11,619 of 1910.—Lionel George John Bratt: Means for securing ornamental or facing bricks particularly for fireplaces.

11,797 of 1910.—Arthur Brooks Norris: Wood-working machines.

14,392 of 1910.—Rudolf Seidel: Floors comprising section blocks and girders composed of such blocks.

14,453 of 1910.—Frederic Thomas: Portable appliances for drilling or boring metals and other hard substances.

14,814 of 1910.—Carl Grähn: Reinforced concrete columns.

17,772 of 1910.—Oscar Franklin Mann: Hangers for supporting doors.

17,961 of 1910.—Edwin Henry Edelsten: Buildings for public or other entertainments.

19,806 of 1910.—Martin McLane: Wrenches for screwing flanges on pipes.

26,361 of 1910.—Louis Broussas: Roofs.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 1.—By BOURNE & SONS.

Modbury, Devon.—Manor House, Sheepham Farm, etc., 185 a., *f.* £10,550

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shop; ct. for court.

TO CORRESPONDENTS.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to "THE PUBLISHER," and *not* to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River. £ s. d.

	£ s. d.
Best Stocks	1 12 0
Picked Stocks for Facings	2 10 0

Per 1000, Delivered at Railway Depôt.

	£ s. d.		£ s. d.
Flettons	1 8 0	Double Headers	13 7 6
Best Fareham Red	3 12 0	One Side and two Ends	17 7 6
Best Red Pressed Ruabon Facing	5 0 0	Two Sides and one End	18 7 6
Best Blue Pressed Staffordshire	3 15 0	Splays & Squints	15 17 6
Do. Bullnose	4 0 0	Best Dipped Salt Glzd. Str'tch'rs	10 17 6
Best Stourbridge Fire Bricks	3 14 0	Headers	10 7 6
GLAZED BRICKS.		Quoins, Bullnose, and Flats	14 7 6
Best White and Ivory Glazed Stretchers	10 17 6	D'ble Stretchers	16 7 6
Headers	10 7 6	Double Headers	13 7 6
Quoins, Bullnose, and Flats	14 7 6	One Side and two Ends	17 7 6
D'ble Stretchers	16 7 6	Two Sides and one End	18 7 6
		Splays & Squints	15 17 6

Second Quality White and Dipped Salt Glazed, £1 5s. per 1000 less than best.

	s. d.	
Thames and Pit Sand	6 6	per yard, delivered.
Thames Ballast	5 0	" "
Best Portland Cement	29 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s. 6d. per yard delivered.
Stourbridge Fireclay in sacks	27s. 0d. per ton at rly dpt.

STONE.

Per Ft. Cube. s. d.

BATH STONE—delivered on road waggons, Paddington Depôt	1 6½
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½
PORTLAND STONE (20 ft. average)—	
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1
White Basebed, delivered on road waggons Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2½

Per Ft. Cube, delivered at Railway Depôt.

	s. d.		s. d.
Ancaster in blocks	1 10	Red Corsehill in blocks	2 3
Beer in blocks	1 6	Closeburn Red Freestone	2 0
Greenshill in blocks	1 10	Red Mansfield Freestone	2 4
Darley Dale in blocks	2 4		

YORK STONE—*Robin Hood Quality.* s. d.

Per Ft. Cube, Delivered at Railway Depôt.

Scappled random blocks	2 10

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3
6 in. rubbed two sides ditto, ditto	2 6
3 in. sawn two sides slabs (random sizes)	0 11½
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½
1½ in. to 2 in. ditto, ditto	0 6

HARD YORK—

Per Ft. Cube, Delivered at Railway Depôt.

Scappled random blocks	3 0

Per Ft. Super., Delivered at Railway Depôt.

6 in. sawn two sides landing to sizes (under 40 ft. super.)	2 8
6 in. rubbed two sides ditto	3 0
3 in. sawn two sides slabs (random sizes)	1 2
2 in. self-faced random flags	0 5

SLATES.

Per 1000 of 1200 at Railway Depôt.

In. In.	£ s. d.	In. In.	£ s. d.
20×10 best blue Bangor	13 2 6	20×10best Eur'ka unfading green	15 17 6
20×12 ditto	13 17 6	20×12 ditto	18 7 6
20×10 1st quality ditto	13 0 0	18×10 ditto	13 5 0
20×12 ditto	13 15 0	16×8 ditto	10 5 0
16×8 ditto	7 5 0	20×10 permanent green	11 12 6
22×10 best blue Portmadoc	12 12 6	18×10 ditto	9 12 6
16×8 ditto	6 12 6	16×8 ditto	6 12 6

TILES.

At Railway Depôt.

	s. d.		s. d.
Best plain red roofing (per 1000)	42 0	Best "Hartshill" brand, plain sand-faced (per 1000)	50 0
Hip and Valley (per doz.)	3 7	Do. pressed (per 1000)	47 6
Best Broseley (per 1000)	50 0	Do. Ornamental (per 1000)	50 0
Do. Ornamental (per 1000)	52 6	Hip (per doz.)	4 0
Hip and Valley (per doz.)	4 0	Valley (per doz.)	3 6
Best Ruabon red, brown, or brindled (Edw'ds) (per 1000)	57 6	Staffords. (Hanley) Reds or Brindled (per 1000)	42 6
Do. Ornamental (per 1000)	60 0	Hand-made sand-faced (per 1000)	45 0
Hip (per doz.)	4 0	Hip (per doz.)	4 0
Valley (per doz.)	3 0	Valley (per doz.)	3 6

WOOD.

BUILDING WOOD.	At per standard. £ s. d.		£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 0 0	...	15 10 0
Deals: best 3 by 9	13 10 0	...	14 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	...	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0		less than 7 in. and 8 in.
Deals: seconds	1 0 0		less than best.
Battens: seconds	0 10 0	"	"
3 in. by in. and 2 in. by 6 in.	9 10 0	...	10 10 0
3 in. by 4½ in. and 2 in. by 5 in.	9 0 0	...	10 0 0

WOOD (*continued*).

BUILDING WOOD (*continued*)—	At per standard. £ s. d.		£ s. d.
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	...	more than battens.
¾ in.	1 0 0		"
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 5 0 0	...	5 10 0
Seconds	4 10 0	...	5 0 0
Small timber (8 in. to 10 in.)	3 17 6	...	4 0 0
Small timber (6 in. to 8 in.)	3 5 0	...	3 10 0
Swedish balks	2 12 6	...	3 0 0
Pitch-pine timber (30 ft. average)	4 10 0	...	5 5 0
JOINERS' WOOD.	At per standard.		
White Sea: first yellow deals, 3 in. by 11 in.	24 10 0	...	25 10 0
3 in. by 9 in.	22 10 0	...	23 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	...	18 0 0
Second yellow deals, 3in. by 11in.	19 0 0	...	20 0 0
" " 3 in. by 9 in.	18 0 0	...	19 10 0
Battens, 2½ in. and 3in. by 7 in.	14 0 0	...	15 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	...	15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	...	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 10 0	...	22 10 0
Do. 3 in. by 9 in.	18 10 0	...	19 10 0
Battens	14 0 0	...	15 0 0
Second yellow deals, 3 in. by 11 in	16 10 0	...	17 10 0
Do. 3 in. by 9 in.	15 0 0	...	16 0 0
Battens	11 10 0	...	12 10 0
Third yellow deals, 3in. by 11 in.	13 10 0	...	14 10 0
Do. 3 in. by 9 in.	13 0 0	...	14 0 0
Battens	10 10 0	...	11 0 0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	15 0 0	...	16 0 0
" " 3 in. by 9 in.	14 0 0	...	14 10 0
Battens	11 10 0	...	12 10 0
Second white deals, 3in. by 11in.	14 0 0	...	15 0 0
" " 3 in. by 9 in.	13 0 0	...	14 0 0
Battens	10 10 0	...	11 0 0
Pitch-pine: deals	19 0 0	...	21 0 0
Under 2 in. thick extra	0 10 0	...	1 0 0
Yellow Pine—First, regular sizes	44 0 0		upwards.
Oddments	32 0 0		"
Seconds, regular sizes	33 0 0		"
Oddments	28 0 0		"
Kauri Pine—Planks, per ft. cube.	0 3 6	...	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 3 0	...	0 3 9
Small " "	0 2 6	...	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 6	...	0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	...	0 0 9½
¼ in. do. do.	0 0 7	...	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 10	...	0 1 1
Selected, Figury, per ft. super. as inch	0 1 6	...	0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	...	0 1 0
Teak, per load	18 0 0	...	22 0 0
American Whitewood planks, per ft. cube	0 4 0	...	0 5 0
Prepared Flooring, etc.—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 6	...	0 17 0
1 in. by 7 in. yellow, planed and matched	0 14 0	...	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	...	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	...	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	...	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	...	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	...	0 13 6
1 in. by 7 in. " "	0 14 0	...	0 18 6
¾ in. by 7 in. white " "	0 10 0	...	0 11 0
1 in. by 7 in. " "	0 12 9	...	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.		£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	...	7 10 0
Compound Girders, ordinary sections	9 0 0	...	10 0 0
Steel Compound Stanchions	11 0 0	...	12 0 0
Angles, Tees, and Channels, ordinary sections	9 0 0	...	10 0 0
Flitch Plates	9 0 0	...	9 10 0
Cast Iron Columns & Stanchions, including ordinary patterns	7 10 0	...	8 10 0

METALS.

IRON—	Per ton, in London. £ s. d.		£ s. d.
Common Bars	8 10 0	...	9 0 0
Staffordshire Crown Bars, good merchant quality	8 15 0	...	9 5 0
Staffordshire "Marked Bars"	10 10 0	...	—
Mild Steel Bars	8 15 0	...	9 5 0
Hoop Iron, basis price	9 5 0	...	9 10 0
" " Galvanised	17 0 0	...	—

(*And upwards, according to size and gauge.)

Sheet Iron Black— Ordinary sizes to 20 g.	9 15 0	...	—
" " 24 g.	10 15 0	...	—
" " 26 g.	12 5 0	...	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15 0 0	...	—
Ordinary sizes to 22 g. and 24 g.	15 10 0	...	—
" " 26 g.	16 10 0	...	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	18 0 0	...	—
" " 22 g. and 24 g.	18 10 0	...	—
" " 26 g.	20 0 0	...	—
Galvanised Corrugated Sheets— Ordinary sizes, 6ft. to 8ft. 20 g.	14 10 0	...	—
" " 22 g. and 24 g.	14 15 0	...	—
" " 26 g.	16 5 0	...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	12 0 0	...	—
Best Soft Steel Sheets, 2 g. & 24 g.	13 0 0	...	—
" " 26 g.	15 0 0	...	—
Cut Nails, 3 in. to 6 in.	10 10 0	...	11 0 0

(Under 3 in., usual trade extras.)

LEAD, &c.

Per ton, in London.

	£ s. d.		£ s. d.
LEAD—Sheet, English, 4lb. and up	16 12 6	...	—
Pipe in coils	17 2 6	...	—
Soil pipe	20 2 6	...	—
Compo pipe	20 2 6	...	—
ZINC—Sheet—	In casks of 10 cwt.		
Vielle Montagne	31 2 6	...	—
Silesian	30 12 6	...	—

Zinc, in bundles, 1s. per cwt. extra.

COPPER— Strong Sheet	per lb. 0 1 0	...	—
Thin "	" 0 1 1	...	—
Copper nails	" 0 0 10	...	—
Copper wire	" 0 0 10	...	—
BRASS— Strong Sheet	" 0 0 11	...	—
Thin	" 0 1 0	...	—
TIN—English Ingots	" 0 1 8	...	—
SOLDER—Plumbers'	" 0 0 8	...	—
Tinmen's	" 0 0 10	...	—
Blowpipe	" 0 1 1	...	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

Per Ft., Delivered.

15 oz. thirds	2¼d.	26 oz. fourths	3¾d.
" fourths	1¾d.	32 oz. thirds	5¼d.
21 oz. thirds	3¼d.	" fourths	4¼d.
" fourths	2¼d.	Fluted Sheet, 15 oz.	3¼d.
23 oz. thirds	4¼d.	" 21 oz.	4¼d.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

Per Ft., Delivered.

⅛ Hartley's	2d.	Figured Rolled, Oxford Rolled, Oceanic, Arctic Muffled and Rolled Cathedral, white	3¼d.
¼ "	2¼d.		
⅜ "	2½d.	Ditto, tinted	5d.

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 3 7
" " " in barrels	"	0 3 8
" " " in drums	"	0 3 10
Boiled " in barrels	"	0 3 10
" " " in drums	"	0 4 1
Turpentine in barrels	"	0 4 6
" in drums	"	0 4
Genuine, Ground English White Lead,	per ton	21 0 0
Red Lead, Dry	"	20 0 0
Best Linseed Oil Putty	per cwt.	0 10 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

Per gallon.

	£ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 6
Fine Elastic Carriage	0 12 0
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 10 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flating Varnish	0 18 0
White Pale Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 0
Berlin Black	0 16 0
Knotting	0 10 9
French and Brush Polish	0 10 6

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the prepaid rate of 19s. per annum, with delivery by *Friday Morning's Post* in London and its suburbs.

To Canada, post-free, 21s. 8d. per annum; and to all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

Remittances (payable to J. MORGAN) should be addressed to The Publisher of "THE BUILDER," 4, Catherine-street, W.C.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursday.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.* unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ASHFORD.—For constructing public convenience in Beaner-road, for the Urban District Council. Mr. W. Terrill, Surveyor, North-street, Ashford:—

A. Laurence	£203 0	E. J. Bowles, Ashford*	£144 15
J. Day & Son	159 0		
W. R. Shippam	152 8		

BANGOR.—For alterations and additions to the Uld Vicarage House to convert it into a church house, for the Right Rev. the Lord Bishop of Bangor. Mr. Harold Hughes, Architect, Diocesan Offices, Bangor:—

Jones & Williams	£1,394 0	R.D.& H. Hughes	£1,276 18
R. J. Jones	1,370 0	J. M. Jones	1,267 0
R. & J. Williams	1,342 0	W. Parry, Bangor†	1,198 0
I. Evans	1,295 0		
W. Jones & Son	1,282 0		

BARNSTON.—For the erection of a detached villa called "Wychwood," Barnston, for Mr. W. H. Blake. Mr. J. H. McGovern, architect, 26, North John-street, Liverpool:—

E. N. Beszant* £396 9 6

CAERPHILLY.—For the erection of a new higher elementary school at Caerphilly, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—

W. Williams	£11,980 0 0	Hamilton & Millard	£9,650 0 0
F. W. Lougher & Co.	10,528 10 0	T. F. Howells	9,491 7 4
D. Davies & Sons	10,300 0 0	F. Bond, Bedaroad, Cardiff*	9,447 2 4
G. Beames	10,098 0 0	R. Jones	9,015 2 6
J. Williams	9,950 0 0	J. Handcock	8,691 6 9
S. Shail	9,900 0 0		

DORCHESTER.—For constructing surface-water conduit from Damers-road to Durngate-street, for the Town Council. Mr. Percival T. Harrison, A.M.Inst.C.E., Borough Engineer:—

J. T. Whetham	£2,170 0 0	Jesty & Baker, North Quay, Weymouth*	£889 14 9
C. E. Slade	1,225 0 0		
Watt Bros.	1,357 12 0		

HEOLYCIW (Glam.).—For the erection of a new school at Heolyciw, Glam., for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—

W. A. Jones, Barry* £3,515 9

HULL.—For alterations, Caroline-street, for Messrs. R. S. Burn, Ltd. Mr. Brownlow Thompson, architect:—

F. Sage & Co.	£1,256 0 0	C. Houlton	£810 0 0
W. Turner	940 0 0	Hebblewhite	794 19 6
F. Bilton	928 0 0	J. Houlton	792 0 0
J. Curtis & Son‡	891 0 0	J. Taylor & Son	788 8 6
J. Richardson	875 10 4	J. Hancock	787 0 0
J. Darneley & Son	867 8 8	V. Knowles	763 8 6
Marsden & Son	829 18 6	R. Orwin	760 0 0
G. Houlton	815 0 0	Railton, Hull*	743 8 3
H. B. Camp	812 16 0	Harris & Sheldon§	583 0 0

‡ Without brickwork.
§ Without brickwork, smith, painter, and plumber.

KENFIG HILL.—For the erection of superstructure of temporary school at Kenfig Hill, Glam., for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—

G. Banbury, Croydon* £600

LIVERPOOL.—For alterations and conversion of dwelling houses into shops, Nos. 263 to 271, Great Homer-street, Liverpool, for Mr. J. H. Foster (Queen & Foster). Mr. J. H. McGovern, architect:—

E. N. Beszant* £663 11 2

LIVERPOOL.—For alterations and conversion of the Adelphi Theatre into the Arena Hall, Christian-street, Liverpool, for Messrs. Harmood, Banner, & Son. Mr. J. H. McGovern, architect:—

G. L. Desver* £488 14 5
Wilkins, electric lighting; Liverpool Gas Co., overhauling gas piping, as a stand-by* 80 0 0

LONDON.—For kerbing, channelling, and metalling the roadways, and paving with artificial stone the pathways of part of Verdant-lane, Lewisham, S.E., for the Borough Council. Mr. Ernest van Putten, Surveyor. Quantities by Surveyor:—

Roadway.
W. Pearce, Forest Hill £1,128
Footways.
Atlas Stone Co., Ltd., Cambridge, 4s. per yd. super.

MERTHYR TYDFIL.—For erecting infants' school at Darren View, for the Education Committee. Mr. F. Thackeray, architect. Quantities by architect:—

A. J. Colborne, Swindon* £3,769 10

MORPETH.—For making-up Bilton's-court, Goosehill, and South-terrace, back street. Mr. J. Davison, Borough Surveyor:—

	Goose Hill-road.	Bilton's-court.	South-terrace.
R. Carse & Sons, Amble and Morpeth	£59 7 0	£100 14 10	£38 15 6*
J. W. Henderson, South Gosforth	£49 18 0*	£77 9 0*	£48 19 0

WANSTEAD.—For making up Belgrave-road (part of), Northumberland-avenue, Park-road, and Windsor road, for the Urban District Council. Mr. C. H. Bressey, Surveyor:—

	Belgrave-road.	Northumberland-avenue.	Park-road.	Windsor-road.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
T. Adams	710 0 0	1,163 0 0	563 0 0	595 0 0
G. J. Anderson	549 0 0	893 0 0	442 0 0	461 0 0
G. Bell & Sons	615 0 0	998 0 0	—	709 0 0
W. & C. French	615 0 0	961 0 0	530 0 0	549 0 0
Griffiths & Co.	640 0 0	980 0 0	560 0 0	540 0 0
W. J. Jackson	709 15 6	1,169 18 1	787 5 0	593 14 0
W. Manders	628 0 0	983 0 0	559 0 0	522 0 0
Parsons & Parsons	630 0 0	978 0 0	550 0 0	525 0 0
Surveyor's estimate	683 4 5	1,068 17 11	575 0 6	573 0 10

NEW BRIGHTON.—For the erection of a pair of semi-detached villas, 35 and 37, Sandymount-drive, New Brighton, for Messrs. W. Holdsworth and J. F. Taylor. Mr. J. H. McGovern, architect:—

E. N. Beszant* £1,164 18 11
Reserved for firegrates, etc. 60 0 0

NEWCASTLE.—For the erection of the King Edward VII. School of Art, Armstrong College. Mr. W. H. Knowles, F.S.A., architect, 25, Collingwood-street, Newcastle:—

Kirk & Brown	£19,737 12 11
Elliott Bros.	18,126 8 3
J. Ferguson	17,856 3 6
Middlemass Bros.	17,343 18 1
S. Fenwick & Co.	17,104 0 0
J. C. Hope	17,020 0 0
J. W. White	16,980 0 0
W. Franklin & Son	16,711 11 5
Blackett & Son	16,524 0 0
T. Lumsden	16,493 0 0
Haswell & Waugh	16,396 0 0
S. F. Davidson & Miller	16,174 15 5
E. Weatherley	16,138 0 0
S. Easten, Ltd.	15,922 0 0
J. Milne	15,851 0 8
E. T. George & Son	15,850 0 0
J. & W. Lowry	15,763 0 0
A. Pringle, Gateshead*	15,349 0 0

NEWTON ABBOT.—For the erection of additional wards at the Infirmary, for the Guardians. Mr. Samuel Segar, F.I.A.S., architect, Union-street, Newton Abbot. Quantities by architect:—

H. Pollard & Co.	£4,160 0	H. Mills	£3,499 0
Parker Bros.	4,150 0	F. A. A. Stacey	3,496 15
W. E. Blake	4,070 0	R. M. Rowse & Co.	3,402 0
R. F. Yeo & Sons	3,939 0	R. Wilkins & Sons	3,295 0
T. C. Gluyas	3,800 0	E. P. Bovey & Son, Torquay†	3,074 0
F. J. Badcock	3,770 0		
F. J. Zealley	3,755 17		
W. G. Coles	3,700 0		

NORMANTON.—For making up Bridge-street, for the Urban District Council:—

E. A. Greaves, Castleford* £412 4 5

OSWESTRY.—For erecting new secondary school, for Salop Education Committee. Messrs Appleyard & Quiggin, architects, Liverpool:—

A. G. Huxley, Malpas £6,528

POTTERS BAR.—For making-up of Cotton-road, for South Mimms Rural District Council. Mr. George Simcox, Surveyor to the Council:—

H. Williams, Hatfield-road, St. Albans* ... £329

STOURTON.—For laying concrete foundation and paving with granite setts on a main road, for Rothwell Urban District Council. Mr. J. Southwart, Engineer and Surveyor to the Council:—

A. Braithwaite & Co.	£636 15 8	W. H. Worthington & Co.	£550 17 8
Dalton & Higgins	629 13 9	W. Keighley, Globe-road, Leeds*	518 13 9
T. E. Sugden	615 7 7	M. P. Pickthall	503 2 0
J. Speight	604 0 1		
A. Stark & Co.	602 5 4		
D. Speight & Sons	562 2 8		

[Surveyor's estimate, £565 18s. 3d.]

TIRPHIL.—For the erection of additions and domestic science centre to the Tirphill Council School, Glam., for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect, Cardiff:—

S. Shail, Llandaff* £2,775

TYCOR (Waterford).—For the construction of a filter bed, for the Waterford Corporation. Mr. John Fleming, Borough Surveyor:—

W. McQuade	£1,858 3 10	J. Hoor	£1,395 0 0
Kinnea & Moodie	1,593 0 0	J. Hearne & Son, Waterford*	1,332 10 0
G. Nolan	1,565 0 0		

Ham Hill Stone.
Doulting Stone.
Portland Stone.
The Ham Hill and Doulting Stone Co., Limited
(incorporating the Ham Hill Stone Co. and C. Trask & Son, The Doulting Stone Co.).
Norton, Stoke-under-Ham, Somerset.
London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

SPRAGUE & CO., Ltd.,
PHOTOLITHOGRAPHERS,
4 & 5, East Harding-street,
Fetter-lane, E.C.

PILKINGTON & CO.
(ESTABLISHED 1838),
DEPTFORD WHARF,
190 & 192, CREEK ROAD, DEPTFORD, S.E.
Telephone No.: New Cross 1102 (two lines).
Registered Trade Mark.
Polonceau Asphalte.
PATENT ASPHALTE AND FELT ROOFING.
ACID-RESISTING ASPHALTE,
WHITE SILICA PAVING.
SEYSSEL ASPHALTE (*Direct from the Mines*).

EWART'S
"EMPRESS"
Established 1834.
Telephone:
2570 North.
Cures in 19 cases out of 20.
Write to-day for Illustrated Catalogue Free to
EWART & SON Ltd.,
346-350, Euston Road, London, N.W.
SMOKE-CURE